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STANDARDIZATION OF SCARLET FEVER ANTISTREPTOCOCCUS SERUMS *

A. B. WADSWORTH, M.D.
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AND
MARY W. WHEELER, B.S., M.A.
ALBANY, N. Y.

At present, the antitoxic titer of scarlet fever antistreptococcus serums is determined by the blanching of the rash in scarlet fever patients, following the intracutaneous injection of serum, as developed first by Dochez [1] and later also by Blake and Trask,[2] or by the reactions induced in susceptible persons by mixtures of toxin and serum injected intracutaneously, as developed by the Dicks.[3] Attempts to devise a satisfactory in vitro method have not been successful.

While the tests on human subjects have been essential in establishing definite standards for measuring the antitoxic value of the serums, they are proving impracticable as routine procedures for standardization. Toxin-antitoxin tests on normal persons are impracticable for the following reasons: the difficulty of securing subjects susceptible to the toxin but not hypersensitive to horse serum; the objection to the repeated injection of foreign serum; the large number of injections that should be made on each person to permit an accurate titration, and the fact that variations in individual susceptibility to the toxin make it desirable to titrate each serum on a comparatively large group of persons. Likewise, with the blanching test, the difficulty of finding a sufficient number of cases with a suitable rash, the difficulty in securing a sharp end point, and the variations in reactions observed even under the most favorable conditions, limit the possibilities of this method. The objection to the injection of horse serum in persons also applies.

After considerable effort, it has been possible, during the last three months, to test one of our serums in only twelve cases of scarlet fever. In two of these, the rash had faded before readings could be made; and, in another, hypersensitiveness to serum, even in high dilutions, interfered with the readings. In three instances, no definite blanching occurred with any of the dilutions of serum tested, the lowest being a 1:2,500 dilution in one case, and a 1:100 in the other two. Definite blanching was observed in the remaining six cases in dilutions of serum varying from 1:5,000 to 1:200,000. In one instance, blanching occurred only in dilutions of 1:5,000 or lower. In another case, it occurred with a 1:200,000 dilution, the highest tested. In the most recent test, a 1:160,000 dilution of serum induced slight blanching. Although it is probable that, under the most carefully controlled conditions, much more uniform and accurate results might be obtained, this series of tests nevertheless illustrates the practical difficulties of the blanching method.

In a third method of titration of scarlet fever streptococcus toxins and antitoxic serums which has been under study in this laboratory for nearly two years, the goat is used as the test animal.[4] During this time, a large number of streptococcus toxins were titrated on goats, and toxin neutralization tests on these animals were used to determine the potency of all trial bleedings from horses under immunization and for the preliminary standardization of serums for therapeutic use. About eighty trial and whole bleedings were tested.

Fourteen of the seventeen goats used for the titration of serums were very satisfactory. A few of these goats showed a slight hypersensitiveness to horse serum or to broth, but this did not interfere with the titrations. Of the three goats that were unsatisfactory, one proved to be so sensitive to serum, even in high dilutions, that no readings could be made, and, with the two others, the reactions to the test dose of toxin used were so slight that it was practically impossible to estimate the titer of the serums.

It was soon found that different goats varied slightly in their susceptibility to the toxin, and that, in order to have an accurate basis for comparison of serums titrated on different goats, it was necessary to make control tests on each animal with a serum of known potency.

With sixteen serums intended for therapeutic use, confirmatory tests were made on satisfactory human subjects. The titer of these serums, as determined by tests on human subjects and on goats, was practically the same in each case, with one exception. The titer of this one serum was slightly lower by the test on the goat than by that on the human subject.

As a result of these studies, a procedure for the standardization of scarlet fever antistreptococcus serums on the goat has been developed, which appears to offer a more accurate, uniform, reliable and practical method of titration than do either of the methods on human subjects. The chief disadvantages in the use of goats have been the difficulty of securing a sufficient number of suitable animals, and the fact that they become hypersensitive to horse serum, so that the same animal cannot be used repeatedly for titrating serums.

* From the Division of Laboratories and Research, New York State Department of Health.

* Read before the joint meeting of the American Association of Pathologists and Bacteriologists and the American Association of Immunologists, April 2, 1926, Albany, N. Y.

1. Dochez, A. R., and Sherman, Lillian: The Significance of Streptococcus Hemolyticus in Scarlet Fever, J. A. M. A. **82**: 542 (Feb. 16) 1924.

2. Blake, F. G., and Trask, J. D.: Observations on Therapeutic Value of Scarlatinal Antitoxin, New York State J. Med. **25**: 1093 (Dec. 15) 1925.

3. Dick, G. F., and Dick, Gladys H.: Therapeutic Results with Concentrated Scarlet Fever Antitoxin, Preliminary Report: Preparation, Standardization and Dosage of the Antitoxin, J. A. M. A. **84**: 803 (March 14) 1925.

4. Kirkbride, Mary B., and Wheeler, Mary W.: Reactions Induced by Intracutaneous Injections of Toxins of Streptococci from Scarlet Fever, Proc. Soc. Exper. Biol. & Med. **22**: 86-87, 1924; Studies of the Toxins of the Hemolytic Streptococci Associated with Scarlet Fever, J. Immunol. **11**: 477-497 (June) 1926.

The first objection can, in time, be met by contracting in advance with breeders of a satisfactory type of goat. The second is of minor importance, since from fifty to sixty injections can be made on a single animal at one time, thus permitting the titration of from ten to fourteen different serums. Furthermore, it has usually been possible to make a second series of tests on the same animal within three or four days, at which time the hypersusceptibility to horse serum has not developed sufficiently to interfere with the titrations of trial bleedings or the preliminary tests of serums. Very recently, further titration tests with serums on one or two goats which had received no injections of toxin or serum for about two months suggest that, after such a period of rest, some goats may again become serviceable.

In our experience, full grown goats from 2 to 4 years of age, with a clear white skin, have been found most suitable for the intracutaneous test. They are apparently more susceptible than young goats, and more tests can be made on each animal. Pure bred or grade Saanen goats, which are usually white, have proved most satisfactory, although both Angora and common American goats have also been used. The latter, however, do not usually have white skins. It is perhaps advisable to avoid having goats in close proximity to horses, since it is possible that such contact might induce hypersusceptibility to horse proteins.

The method consists of comparative tests of the test serums with a standard serum against a test dose of a standard toxin, made, at the same time, on the same animal under carefully controlled conditions.

The first step was the selection of a standard toxin as the basis for the standardization of a standard serum. For this purpose, a highly potent, stable toxin, preferably produced by a single strain of streptococcus possessing broad antigenic activity, was considered essential. The Dochez strain of streptococcus, N. Y. 5, already in use in this laboratory as the standard, most nearly approached these requirements. A toxin produced with this strain was therefore selected for the standard and carefully titrated on a number of human subjects in comparison with the U. S. Hygienic Laboratory standard Dick toxin, which is prepared from two strains.

A highly potent, unconcentrated scarlet fever antistreptococcus serum was then selected for the standard serum and was titrated on a number of persons against our standard toxin and also against the U. S. Hygienic Laboratory standard Dick toxin. The titer of the standard serum was found to be 200 units per cubic centimeter according to the unit value suggested at an informal conference held in Washington, D. C., in May, 1925; that is, that 1 unit of antitoxin neutralizes 100 human skin test doses of toxin. The serum has since been tested at intervals for a period of more than nine months without evidence of appreciable deterioration. Part of this standard serum has now been preserved with glycerin, and frequent tests are made on both the preserved and the unpreserved serum.

*Result of the Titration of Scarlet Fever Antistreptococcus Serum 32 in Comparison with Standard Serum 28 as Tested on the Goat and on Human Subjects**

	Amounts of Serum and Toxin Injected in 0.1 Cc. of Mixture		Reactions in Goat 34 at	Reactions in Human Subjects at 24 and 48 Hours						
	Serum	Toxin	18 Hours	Reading	1	2	3	4	5	6
Serum 32	1:30,000	1:40,000	No reaction	24 hours	No reaction	No reaction	V. Sl. Rd. 0.5 × 0.5 cm.	No reaction	No reaction	V. Sl. Rd. 0.5 × 0.5 cm.
				48 hours	Not read	No reaction	Not read	Not read	No reaction	Rd. 1 × 1 cm.
	1:40,000	1:40,000	No reaction							
	1:50,000	1:40,000	V. Sl. Rd. 1 × 1 cm.	24 hours	V. Sl. Rd.	No reaction	Rd. 1 × 1 cm.	No reaction	No reaction	V. Sl. Rd. 1 × 1 cm.
				48 hours	Not read	No reaction	Not read	Not read	Rd. 1 × 1.5 cm.	Rd. 2 × 2 cm.
	1:60,000	1:40,000	V. Sl. Rd. 2 × 2 cm.							
Standard serum 28	1:10,000	1:40,000	No reaction							
	1:20,000	1:40,000	V. Sl. Rd.	24 hours	No reaction	No reaction	V. Sl. Rd. 0.5 × 0.5 cm.	No reaction	No reaction	No reaction
				48 hours	Not read	No reaction	Not read	Not read	No reaction	Rd. 0.5 × 0.5 cm.
	1:30,000	1:40,000	Sl. Rd. 2 × 2 cm.							
Standard toxin 52	.....	1:80,000	Sl. Rd., Sl. Sw. 2 × 2 cm.							
	.....	1:40,000	Sl. Rd., Sl. Sw. 3 × 3 cm.	24 hours	Rd., Sl. Sw. 2.5 × 2.5 cm.	Sl. Rd. 2 × 2 cm.	Rd., V. Sl. Sw. 2.5 × 2.5 cm.	Sl. Rd. 2 × 2 cm.	Rd., Sw. 2 × 2 cm.	Rd. 3 × 3 cm.
				48 hours	Not read	Fading	Not read	Not read	Fading	Fading
	.....	1:20,000	Sl. Rd., Sl. Sw. 3.5 × 3.5 cm.							
Heated toxin Control	.....	1:20,000	No reaction†	24 hours (at 1:40,000)	No reaction	No reaction	No reaction	No reaction	No reaction	No reaction
				48 hours	Not read	No reaction	Not read	Not read	No reaction	No reaction
Broth control	.....	1:20,000	No reaction†							
Serum control 1:1,000	.....		No reaction	24 hours (at 1:2,000)	No reaction	No reaction	No reaction	No reaction	No reaction	No reaction
				48 hours	Not read	No reaction	Not read	Not read	No reaction	No reaction

* From these tests the titer of serum 32 was estimated as approximately 400 units per cubic centimeter.
† These controls were included in a previous test on this goat.

Having established the titer of the standard toxin and of the standard serum in terms of the human subject, a parallel series of titration tests was made to determine their reactions in the goat, which was to be used as the test animal in future work.

Evidence of marked instability had been observed in some of our streptococcus toxins, especially those of high initial potency, while the serums were apparently much more stable. It was therefore decided to adopt the serum as the practical standard of measurement, and to titrate new lots of standard toxin against the standard serum, although this serum must be standardized originally against a standard toxin selected as representative. Moreover, because of variations observed in titrating the same serum against different toxins, it was considered more accurate to base the test dose of standard toxin on its combining power with a definite dose of the standard serum, rather than on a definite number of skin test doses of toxin. The test dose of toxin, therefore, has been defined as the greatest amount of toxin that will just fail of neutralization with

a test dose of the standard serum (either 1/10 or preferably 1/100 unit) in from eighteen to twenty hours. Such a mixture will usually induce a very slight redness, about 0.5 to 1 cm. in diameter.

Although, theoretically, the use of a test dose of toxin based on 1/10 unit or more of antitoxin should give more accurate results than a test dose based on 1/100 unit, in our experience the test dose of toxin based on 1/100 unit of antitoxin has proved more satisfactory. Thus, while tests with serums titrated against both test doses of toxin usually agree very closely, recent experience has indicated that the lower dilutions of serum required in titrating against the larger test dose of toxin may frequently induce serum reactions in goats not sensitive to higher dilutions. However, when goats are used that are not highly susceptible to the toxin, larger doses of toxin are to be preferred.

To determine the potency of test serums, varying doses of serum combined with a test dose of standard toxin are injected, in 0.1 cc. amounts, intracutaneously into goats, control tests being made at the same time with mixtures of the standard serum and standard toxin, and with standard toxin, heated and unheated, and with uninoculated toxin broth and serum alone. Tests on trial bleedings and preliminary tests of whole bleedings are usually made on one animal only. Serums to be distributed for therapeutic use are tested on at least two animals, and the results are controlled, from time to time, on human subjects.

Goats found to be susceptible to high dilutions of the standard toxin are selected for the test, and the hair is very carefully removed from the sides of the chest and abdomen by clipping and by the use of a barium sulphide and starch depilatory. This is done several hours before the injections are made or on the previous afternoon.

Three or four dilutions of the test serum are prepared, the desired doses being contained in 0.05 cc. Thus, for a serum estimated at approximately 300 units per cubic centimeter, the dilutions prepared are 1:1,000, 1:1,500 and 1:2,000, each 0.05 cc. containing, respectively, 1/20.000, 1/30.000 and 1/40.000 cc. of serum. One cubic centimeter of each serum dilution is then combined with 1 cc. of a dilution of standard toxin containing one test dose in 0.05 cc. Control mixtures of standard serum and toxin containing 1/50, 1/100 and 1/150 unit of antitoxin and one test dose of the standard toxin are prepared similarly. The same precision is used in preparing and combining the dilutions as in the standardization of diphtheria and tetanus antitoxins. All mixtures of toxin and serum are allowed to stand for at least one-half hour before being injected, but no change has been noted up to three hours. The dose given is 0.1 cc. Further control injections are also made with three dilutions of the standard toxin containing one half, one, and two test doses in 0.1 cc.; with heated toxin (two test doses heated for one hour at 100 C.) and with uninoculated toxin broth alone and each serum alone, the doses being equivalent to the largest amount of broth or of each serum respectively present in mixtures of toxin and serum.

Readings are made in a bright light after from eighteen to twenty hours, the degree of redness and swelling and the size of the area in centimeters being noted. The reactions induced by the mixtures containing the test serums are compared with the reactions induced by mixtures containing the standard serum and also with those induced by the toxin, serum and broth controls. The serum and broth controls are usually negative, but slight reactions may occur, especially with low dilutions of serum, and these must be taken into account when interpreting the results.

The estimated potency of the test serum is based on the mixture of serum and toxin that induces a reaction slightly less than, or equal to, that induced by the mixture containing the test dose of standard serum (1/100 unit). At least one dilution of the test serum should completely neutralize the toxin. If two or more of the higher dilutions induce very slight reactions, similar to that induced by the standard serum, the titer is based on the mixture containing the greatest amount of serum. When therapeutic serums are titrated, should the tests on the different goats show variations, further titrations are made on other goats. This is, however, seldom necessary. The titer of serums can usually be determined to within from 50 to 100 units with the present scale of dilutions. In the case, however, of serums with a titer considerably below 100 units, especially if they are concentrated, the method has proved less satisfactory, as the result, in part at least, of serum reactions induced by the low dilutions of serum.

Comparative titrations with the same serum against the Dochez standard toxin and against the U. S. Hygienic Laboratory Dick toxin have given similar results. However, much lower dilutions of the Dick toxin are usually required, since it appears to be less potent on the goat.

The results of the titration of one serum tested both on goats and on human subjects is shown in the accompanying table.

The method, as outlined, has now been in routine use for more than six months, during which time satisfactory tests of forty trial and whole bleedings [5] have been obtained on nine goats. The results on a tenth goat proved unsatisfactory because the animal was hypersensitive to serum. These tests are in addition to those of the eighty serums tested during the two years that the methods of standardization have been under study.

THE IDENTIFICATION OF THE STREPTOCOCCUS OF SCARLET FEVER *

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In 1920, I [1] reviewed the literature on agglutination of streptococci found in scarlet fever and showed by means of immune sheep serums that 92 per cent of the streptococci in the acute stage of scarlet fever and 100 per cent of those from erysipelas belonged to distinct biologic groups, which could be differentiated from one another and from the hemolytic streptococci in other infections. These conclusions were reached by the study of opsonification, agglutination, absorption and protection experiments. These and later studies demonstrated that the streptococci specific for scarlet fever began to disappear as early as the second week of the disease, but that they persisted much longer (six weeks) in patients with discharges. It was found that complications beginning after the third week were generally not due to scarlatinal streptococci. Specific scarlet fever streptococci were also isolated from the pus of infections (finger, burn, vaccination lesion and lochia in puerperal sepsis) followed by scarlet fever. It was also

5. All the serums tested, with the exception of 17, have been unconcentrated. Retests on several potent unconcentrated serums, after from six to ten months, have given no evidence of appreciable deterioration; but, in retests of one concentrated serum which had become cloudy after a year, a definite decrease in titer was noted. In tests with concentrated serums prepared by other laboratories, marked discrepancies between the recorded titer and that obtained on both human subjects and on goats were found in several instances. Since these discrepancies would appear to be far in excess of the limits of error of the methods of standardization employed, the possibility of these concentrated serums being unstable must be considered.

* From the John McCormick Institute for Infectious Diseases.

1. Tunnicliff, Ruth: Specific Nature of Hemolytic Streptococcus of Scarlet Fever, J. A. M. A. **74**: 1386 (May 15) 1920; Further Studies on Specificity of Streptococci, ibid. **75**: 1339 (Nov. 13) 1920; J. Infect. Dis. **29**: 91 (July) 1921; **31**: 373 (Oct.) 1922.

shown that persons associated with scarlet fever might develop tonsillitis without an exanthem and harbor scarlatinal streptococci. Streptococci specific for scarlet fever were isolated from eating utensils (fork, spoon and cup) used by scarlet fever patients and also from the outside of a face mask of the nurse in attendance. The conclusion was drawn that opsonification and agglutination tests with immune serum were helpful in the identification of scarlet fever streptococci.

Similar conclusions concerning the specificity of streptococci from scarlet fever have been reached from agglutination and agglutination absorption experiments with immune rabbit serum by Bliss,[2] Gordon,[3] Stevens and Dochez,[4] Dochez and Sherman [5] and Eagles.[6]

Birkhaug [7] has verified, for both scarlet fever and erysipelas streptococci, the accuracy of the agglutination and agglutination absorption tests, by ingenious intradermal local passive immunity experiments. On the other hand, Williams [8] and her co-workers have found that only 40 per cent of the streptococci from scarlet fever belong to one group.

Since the etiologic relation of the streptococcus to scarlet fever appears assured, it has seemed worth while to continue the work on streptococcus agglutination for identifying scarlatinal streptococci. The Dicks [9] recommend the neutralization of toxin with immune serum as a means of recognizing scarlet fever streptococci. The precipitin reaction described by Rosenow [10] may later prove of value in the diagnosis of scarlet fever streptococci.

AGGLUTINATION WITH CONVALESCENT HUMAN SERUM

Dr. Herrold and I [11] have shown that, by concentrating convalescent scarlet fever serum by a method devised by him, we could by agglutination tests differentiate scarlatinal streptococci from others. It had previously been found by Bliss [12] that agglutinins could not be demonstrated in scarlet fever serum before the eighteenth day. We tested fifteen scarlet fever serums, eight convalescent diphtheria serums and one serum from a woman who had had scarlet fever two years previously, with eight strains of streptococci from scarlet fever and seven strains from other sources. On account of the difficulty of keeping animals immune, and the rapidity with which some serums lose their antibodies, it was thought that concentrated human serum might be more convenient for identifying scarlatinal streptococci for diagnostic purposes and therefore these experiments have been continued.

The streptococci were grown for twenty-four hours in 1 per cent dextrose broth mixed with ascites fluid 1:3; the culture was then centrifugalized and the cocci suspended in salt solution. The scarlet fever serum was concentrated by precipitation of the euglobulin and the lower pseudoglobulin fractions with a saturated solution of ammonium sulphate, in the proportion of 2 cc. of serum to 1.2 cc. of ammonium sulphate solution; after standing at room temperature thirty minutes, the tube was centrifugalized, the fluid poured off, and the tube inverted and flamed to precipitate the ammonium sulphate and serum still left on the sides of the tube, in order to minimize the amount of ammonium sulphate which would be mixed with the solution of the precipitate. The precipitate from 2 cc. of serum was then dissolved in 0.4 cc. of salt solution, and this solution designated as concentrated serum.

The concentrated serums were diluted five times with salt solution, and an equal amount of bacterial suspension was added to each. Final dilutions of concentrated serum lower than 1:5 gave confusing results, on account of partial coagulation of the mixture, when incubated for three or four hours at 55 C. The agglutinating mixtures as well as the control tubes with salt and ammonium sulphate solutions were incubated for four hours at 55 C. and read. With concentrated serum, little agglutination occurred before three or four hours. Concentrated serum was found to retain its agglutinative power for not more than two months, generally about six weeks.

As a rule, eight strains of streptococci were tested with each serum, the same strain being examined with several different scarlatinal and nonscarlatinal serums.

Fourteen scarlet fever serums collected during the fourth week of the disease, two serums from suspected cases of scarlet fever, four from tonsillitis, three from measles patients and one from diphtheria were concentrated with ammonium sulphate and tested for their agglutinating power on hemolytic streptococci. Twenty-five strains were isolated from acute cases of scarlet fever; two strains from cases of tonsillitis in nurses of scarlet fever patients; one strain from the throat in a doubtful case of scarlet fever; eleven strains from the throats of patients with acute tonsillitis; two strains from the throat of diphtheria patients; one strain from measles, and one from a finger of a person who had previously had scarlet fever, now accidently infected with a streptococcus culture from scarlet fever.

The fourteen scarlet fever serums agglutinated all the scarlatinal streptococci, those from the two nurses of scarlet fever patients, from the finger infected with scarlet fever streptococci, from the suspected case of scarlet fever, and from one of the cases of tonsillitis. The serum from a suspected case of scarlet fever with typical onset and some eruption, without desquamation, agglutinated the streptococcus from the patient's throat and three known scarlatinal strains, but did not agglutinate four strains from other sources; the serum of the second suspicious case did not agglutinate any of the streptococci tested. The remaining serums failed to agglutinate either scarlatinal or other streptococci, in one instance of tonsillitis not even the homologous streptococcus, indicating that in tonsillitis demonstrable streptococcus agglutinins may not develop.

The streptococcus isolated at entrance and two weeks later from a patient with tonsillitis was agglutinated by the scarlet fever serums, indicating that this patient had scarlet fever without an eruption or was a carrier of the scarlet fever streptococcus.

A rabbit was immunized, as described later, first with killed and then with living nonmannite fermenting streptococci from an infected vaccination wound followed by scarlet fever. The serum of this rabbit agglu-

2. Bliss, W. D.: Bull. Johns Hopkins Hosp. **31**: 173 (May) 1920; J. Exper. Med. **36**: 575 (Nov.) 1922.
3. Gordon, M. H.: Brit. M. J. **1**: 632 (April 30) 1921.
4. Dochez, A. R., and Stevens, F. G.: Proc. Soc. Exper. Biol. & Med. **21**: 39, 1923; J. Exper. Med. **40**: 253 (Aug.) 1924; Occurrence of Throat Infections With Streptococcus Scarlatinae, Without a Rash, J. A. M. A. **86**: 1110 (April 10) 1926.
5. Dochez, A. R., and Sherman, L.: Significance of Streptococcus Hemolyticus in Scarlet Fever, J. A. M. A. **82**: 542 (Feb. 16) 1924.
6. Eagles, G. H.: Brit. J. Exper. Path. **5**: 199 (Aug.) 1924.
7. Birkhaug, K. E.: Bull. Johns Hopkins Hosp. **37**: 307 (Nov.) 1925.
8. Williams and others: City of New York Dept. of Health Weekly Bull. **14**: 106, 1925.
9. Dick, G. F., and Dick, Gladys H.: Method of Recognizing Scarlet Fever Streptococci, J. A. M. A. **84**: 802 (March 14) 1925.
10. Rosenow, E. C.: The Precipitin Reaction, J. A. M. A. **86**: 9 (Jan. 2) 1926.
11. Herrold, R. D., and Tunnicliff, Ruth: J. Infect. Dis. **34**: 209 (March) 1924.
12. Bliss (footnote 2, second reference).

tinated in high dilutions all the strains agglutinated by the concentrated convalescent scarlet fever serums, but not the other strains, the two serums being equally specific.

One scarlatinal strain isolated from the blood, a mannite fermenter, was agglutinated in high dilutions by the serum of the rabbit immunized with a nonmannite fermenter scarlet fever streptococcus. This is in accord with the results of Ruediger,[13] who found that the fermentation of mannite and agglutination did not necessarily correspond, some nonmannite fermenters being agglutinated by the serum of a sheep immunized with a mannite fermenter. His table shows, too, that the serum of a sheep immunized with a nonmannite fermenter also agglutinated a mannite fermenter. The Dicks,[14] however, were unable to demonstrate any cross agglutination between the two strains of scarlatinal streptococci studied by them and the serum of sheep immunized with each of the two, one being a mannite fermenter, the other not.

AGGLUTINATION WITH IMMUNE RABBIT SERUM

As pointed out in a previous paper, to obtain an immune rabbit serum specific for scarlet fever streptococci I[15] found it essential to give only a few doses; otherwise, polyvalence developed. The first dose consisted of the twenty-four hour growth in 10 cc. of ascites dextrose broth, centrifugalized, suspended in salt solution, and the cocci killed, commonly by heat. Generally it is necessary to give small numbers of living organisms from time to time to keep up the production of antibodies. Two strains of scarlet fever streptococci and two strains isolated from patients in no way associated with scarlet fever are used as controls in each experiment, in order to determine the specificity of the serum. If the nonscarlatinal strains are agglutinated, the serum is set aside as not specific. If a serum agglutinates these two nonscarlatinal strains in only low dilutions, higher dilutions of the serum may be used for identification purposes. The experiments are also controlled with normal rabbit serum. For the suspensions the streptococci are grown in ascites dextrose broth twenty-four hours, centrifugalized and suspended in phosphate broth of p_H 7.5. It is sometimes necessary to transfer an organism several times in fluid mediums to obtain a smooth suspension, but no strain has been encountered which eventually did not grow homogeneously. The agglutination test is made at 55 C. for one hour.

Three rabbits were now immunized as just described with scarlet fever streptococci and each streptococcus strain tested, as a rule, with two different serums. Dr. Katharine Howell of Michael Reese Hospital and Dr. T. T. Crooks isolated the majority of the cultures used in these experiments.

Twenty-two hemolytic streptococcus strains were isolated from nonscarlatinal patients, one from erysipelas, ten from throats of persons with acute tonsillitis, three from throats of persons closely associated with scarlet fever, four from abscesses, one from blood, two from spinal fluids, and one from pleuritic fluid. None of these streptococci were agglutinated by immune rabbit serum; hence, they were not of scarlatinal origin.

Immune rabbit serum agglutinated all the sixteen strains of hemolytic streptococci isolated from scarlet fever patients at the onset of the disease, fourteen from throats, one from a dog bite infection followed by scarlet fever, and one from an infected eye. One of the throat cultures was isolated four days before the appearance of the eruption.

Thirteen strains of hemolytic streptococci isolated from carriers and persons with acute tonsillitis without a rash were also found by agglutination tests to belong to the scarlatinal group of streptococci. Six of these cultures were from persons closely associated with scarlet fever patients, five from sore throats and one from the infected finger of an intern (Dick negative), who had had scarlet fever two years before. Scarlet fever streptococci were isolated from three persons with subacute tonsillitis, one of whom had been out of quarantine from scarlet fever five weeks and two, eight weeks; from the sputum of a boy one year after his attack of scarlet fever, and from the subacutely inflamed tonsils of a child who gave a history of a previous attack of tonsillitis followed by otitis media. One strain was isolated from a medical student with an acute tonsillitis without eruption, developing four days after exposure to scarlet fever. Scarlatinal streptococci were still present in his throat three weeks later. Streptococci specific for scarlet fever were isolated from the throat of a man (Dick negative) with an acute sore throat and a transient erythema, whose cihld developed a typical toxic case of scarlet fever four days later. Scarlet fever streptococci were also cultivated from the child's throat. It seemed probable that the child contracted scarlet fever from the father, as it had not been otherwise exposed.

These observations and those of Bliss and of Stevens and Dochez show that scarlet fever streptococci may persist long after the usual period of quarantine. Bliss[12] found them at the end of a year after an attack of scarlet fever. Stevens and Dochez[16] isolated them in 47.3 per cent of patients at the end of thirty days' quarantine, most of them in patients with inflamed tonsils. From my experiments, it appears that persons who have previously had scarlet fever may later become infected with scarlatinal streptococci. The recent experiments of Stevens and Dochez[17] corroborate those of Bliss,[18] Tunnicliff[19] and Rosenow[10] that infections of the throat with scarlatinal streptococci may occur without an eruption and show that agglutination reactions and toxin production are closely parallel.

A MODIFIED OPSONIC TECHNIC FOR RAPID DIAGNOSIS OF SCARLET FEVER

It is sometimes useful to be able to make a rapid diagnosis in suspected cases of scarlet fever in which the rash is not sufficiently distinct for a Schultz-Charlton extinction test with immune serum. Since the shortest time possible to identify streptococci by agglutination tests is generally three days after making the original culture, it seemed worth while to try to devise a method of recognizing the cocci in the hemolytic colonies on the original blood agar plate. So far, it has not been possible to use these colonies for microscopic agglutination tests, but they are suitable for suspensions for opsonic experiments. In cultures made early in scarlet fever from throats or discharges, only specific streptococci are present or predominate to such an extent that suspensions made from several colonies

13. Ruediger: J. Infect. Dis. 3: 755, 1906.
14. Dick, G. F., and Dick, Gladys H.: Prevention of Scarlet Fever, J. A. M. A. 83: 84 (July 12) 1924.
15. Tunnicliff (footnote 1, fourth reference).
16. Stevens and Dochez (footnote 4, second reference).
17. Stevens and Dochez (footnote 4, third reference).
18. Bliss (footnote 2, first reference).
19. Tunnicliff (footnote 1, third and fourth reference).

are certain to contain the scarlet fever streptococcus. Single colonies may be transplanted and tested later.

The following simplified opsonic method has been found useful in identifying streptococci and in testing the opsonic strength of antistreptococcus serums:

1. Normal and immune rabbit serums are heated at 56 C. for one-half hour, to get rid of normal opsonins. The heated serum is more specific than the unheated serum necessary for agglutination tests. Some serums retain their opsonic content for several weeks, sometimes months, and may be kept in the icebox for future use.

2. Equal parts of normal human blood and 2 per cent sodium citrate in salt solution are mixed. Three large drops of blood are sufficient for twelve specimens.

3. Streptococci on the original blood agar plate or from subcultures are suspended in a large drop of salt solution in a petri dish. Thick suspensions are to be avoided in order to escape getting too much phagocytosis for accurate counts.

4. Equal parts of serum, citrated blood and bacterial suspension are mixed in capillary pipets, and the mixtures incubated twenty-five minutes at 36 C. The mixtures are smeared on glass slides, 50 or more polymorphonuclear leukocytes counted and the number of cells taking part in phagocytosis noted (phagocytic index). If the phagocytic index of the immune serum exceeds that of normal serum determined by the same method, it is concluded that the colonies contain scarlatinal streptococci.

The phagocytic index of the immune serum divided by that of normal serum represents the opsonic power of the immune serum.

If the serums have been previously heated, identification of the streptococcus may be made within an hour. Twelve strains of hemolytic streptococci from nonscarlatinal sources gave indexes with immune serum varying from 0.8 to 1.0; sixteen scarlatinal strains gave indexes from 1.6 to 5.5. Cultures giving indexes as low as 1.6 should be tested again. All but one of the strains mentioned were examined by agglutination tests also, and the two methods gave the same results.

CONCLUSIONS

The results of these experiments indicate that concentrated convalescent scarlet fever serums and the serum of rabbits properly immunized with scarlatinal streptococci are equally specific and are helpful in identifying scarlatinal streptococci, in studying doubtful cases of scarlet fever and in discovering carriers.

By making opsonic tests directly with streptococci from colonies on the original blood agar plate, it is possible to detect scarlatinal streptococci sooner than by agglutination or toxin production as now determined.

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Ways of Reaction to Psychic Trauma.—How does an animal react to danger or fear? In one of the three ways—flight, fight or fright. All of these reactions are mainly in the instinctive and emotional level. It may be through conscious perception that fear is roused; but, once aroused, conscious thought and reason take a secondary place in the reactions. The sympathetic nervous system, which is intimately associated with emotion, assumes control. In the case of flight, through the action of the sympathetic, the animal's limbs are flushed with blood, and the whole of its potential energy is focused and directed to speed. The hunted hare has only one motive—to run as it never in its life ran before. I think it must be admitted that nervous fear of company may cause blushing in a young girl without inferring sexual wishes and repressions in her infantile and unconscious life. If flight is checked or is impossible, the animal may seek safety in fight; a cornered rat will turn and fight man or cat. A man, if he cannot escape by flight, may turn and fight with the fury of a Berserker. In the remaining reaction, fright, the object is to escape by concealment. The rabbit crouches down, trusting that the dogs will overlook him; theirs is an actual paralysis of motion and of will. —Davis, A. E.: *Lancet* **2**:118 (July 17) 1926.

EXOPHTHALMIC GOITER AND TOXIC ADENOMA

CLINICAL VARIATIONS OF A SINGLE DISEASE*

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It is commonly held that exophthalmic goiter and toxic adenoma are two separate diseases. The distinction between these two diseases seems to be based, in part at least, on a consideration of differences in (1) clinical manifestations, (2) anatomic and histologic alterations in the thyroid and (3) the response to iodine therapy. It is my purpose to discuss the foregoing considerations only as they have a direct bearing on the proposition that exophthalmic goiter and toxic adenoma are two fundamental entities.

CLINICAL CONSIDERATIONS

Exophthalmic Goiter.—There is very little difficulty in recognizing, clinically, cases of classic exophthalmic goiter; the symptoms and signs are too well known to require repetition.

More important in the present discussion are the less typical cases (without adenomatous thyroids) in which there is historical or physical evidence of long standing disability. In such cases there may be questionable eye signs, including exophthalmos; there may be alterations in the blood pressure and pulse pressure that are not in conformity with those said to be characteristic in cases of exophthalmic goiter; there may be mild degrees of nervousness, palpitation, tachycardia, vasomotor disturbances, increased appetite, loss of weight and strength; there may be a preponderance of cardiovascular phenomena (auricular fibrillation, myocarditis, decompensation), and there may be slight diffuse thyroid enlargement with or without thrill or bruit.

Any single clinical manifestation mentioned above may be absent in some cases; hence, none can be considered pathognomonic. In other cases a few or various combinations of these symptoms and signs may be present, but in such mild degrees as to be of no particular significance in the differentiation of these cases from cases of so-called toxic adenoma on the basis of clinical manifestations alone. In certain cases the clinical manifestations, as to both character and degree, simulate very closely those commonly encountered in the clinical state called toxic adenoma, but the absence of adenomas in the thyroid precludes any other diagnosis than that of exophthalmic goiter.

Of equal importance in the present discussion are the cases that present many of the symptoms and signs of exophthalmic goiter and in addition show adenomatosis or adenomatous nodules in the thyroid. In such cases there may be exophthalmos, thrill and bruit in the thyroid, well defined nervousness, palpitation, tachycardia, increased appetite, loss of weight and strength, and other symptoms to such an extent that a diagnosis of exophthalmic goiter cannot be avoided.

In the light of present day teaching, certain questions will naturally arise. Do such patients have one disease (exophthalmic goiter) or two distinct diseases (exophthalmic goiter and toxic adenoma) at the same time? If they have exophthalmic goiter only, what considerations permit us to ignore the presence of adenomas in these cases and yet require us to attach so much significance to adenomas of the same character, so far as can be detected clinically, in the group called toxic

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adenoma? If we are dealing with two diseases in these cases, what should be the proper procedure with regard to the administration of iodine as a measure preliminary to operation? This question will be considered later in the paper.

Toxic Adenoma.—There is little difficulty in recognizing, clinically, a certain group of cases, with long standing adenomatous goiter, in which many of the classic symptoms and signs of exophthalmic goiter are absent or present in only a slight degree. The absence of exophthalmos and thrill and bruit in the thyroid; the slight degree or absence of nervousness, palpitation, tachycardia, vasomotor and gastro-intestinal disturbances; the absence of increased appetite and the loss of weight and strength; the increased blood pressure, both systolic and diastolic, with or without increased pulse pressure; the presence or predominance of cardiovascular phenomena (auricular fibrillation, myocarditis, decompensation): these, according to our understanding, constitute the major considerations for a clinical diagnosis of toxic adenoma. The occurrence of a preponderance of these manifestations in a particular case creates a picture that would appear to be fairly definite from a purely clinical standpoint. But in what respect does any single symptom or sign, or any combination of symptoms or signs enumerated above, differ from those previously mentioned in considering atypical cases of exophthalmic goiter?

In the cases of atypical exophthalmic goiter, it was the absence of adenomatous thyroid, whereas in the group now under consideration (toxic adenoma) it is the presence of adenomatous thyroid, that seems to determine the clinical diagnosis. In other words, in two cases of toxic goiter, with symptoms and signs quite similar, the one without adenomatous thyroid is diagnosed as exophthalmic goiter, and the one with adenomatous thyroid is diagnosed as toxic adenoma.

It is seriously open to question whether the clinical presence or absence of adenomatous thyroid furnishes a basis for differentiation that is fundamental. Nor does it appear, from a consideration of the pathologic alterations in the thyroid itself in exophthalmic goiter and toxic adenoma, that we are in any better position to formulate a satisfactory basis for the recognition of two disease entities.

THE THYROID GLAND IN EXOPHTHALMIC GOITER AND TOXIC ADENOMA

Exophthalmic Goiter. — Diffuse parenchymatous hypertrophy and hyperplasia have been considered specific changes in the thyroid in cases of exophthalmic goiter. Years ago, Marine and Lenhardt[1] demonstrated the fallacy of this dogma, yet, in spite of their clear-cut experiments and observations, articles appearing in 1925 tend to perpetuate the error. The fact is that man and lower animals suffering from simple endemic goiter, curable by the simple administration of iodine, present clinically and pathologically, qualitatively and quantitatively, every manifestation commonly considered characteristic of exophthalmic goiter, so far as the thyroid is concerned. Excellent examples of such cases in both man and animals (dogs) have come under our observation within the last two years.

Certainly it cannot be denied that some patients with many of the symptoms and signs of exophthalmic goiter, including exophthalmos, thrill and bruit in the thyroid, and diffuse parenchymatous hypertrophy and hyperplasia, have adenomas in the thyroids. These adenomas may be undifferentiated, partially differentiated, or completely differentiated; they may be single, multiple or diffuse; they may be in a state of hypertrophy and hyperplasia or in a colloid state. It is a singular circumstance that these adenomas, which cannot be distinguished pathologically from adenomas of various forms and states occurring in toxic adenoma and simple endemic goiter, can be totally ignored in cases that necessarily must be diagnosed as exophthalmic goiter, and yet assume such important significance in the formulation of an entirely different disease as is contemplated in the conception of toxic adenoma as an entity.

Toxic Adenoma.—In an extensive experience with pathologic conditions of the thyroid, we have been unable to detect a single quality of adenomatous thyroid tissue that can be recognized as constantly present in toxic adenoma and constantly absent in exophthalmic goiter and simple endemic goiter. In toxic adenoma and simple endemic goiter, hypertrophic and hyperplastic adenomas may be surrounded by nontumorous colloid thyroid tissue; and colloid adenomas, by nontumorous hypertrophic and hyperplastic thyroid tissue.

What relation, if any, exists between adenomatous and nonadenomatous thyroid tissue as regards their capacity for the production of clinical manifestations? So far as we are aware, there is little or no evidence to disprove but considerable evidence to support the view that any physiologic, chemical, pharmacologic, biologic or pathologic potentialities that adenomatous thyroid tissue may have are at least similar to if not identical with those of nonadenomatous thyroid tissue. Under such circumstances, there appears to be very little reason for attributing to adenomatous tissue a propensity for the production of clinical manifestations that would not have their counterpart in nonadenomatous thyroid tissue, and vice versa. There appears to be even less reason for assuming adenomatous and nonadenomatous thyroid tissue to be capable of producing only diametrically opposite clinical phenomena.

From the standpoint of pathologic anatomy of the thyroid there appear to be insufficient grounds for a fundamental distinction between exophthalmic goiter and toxic adenoma as two different entities. We may next consider the effects of iodine therapy.

THE RESPONSE TO IODINE THERAPY IN CASES OF EXOPHTHALMIC GOITER AND TOXIC ADENOMA

The administration of iodine as a preoperative preparation for thyroidectomy in cases of exophthalmic goiter is now quite generally accepted. Our experience is in accord with this principle.

Up to the present time, proponents of the theory that toxic adenoma is an entity in contradistinction to exophthalmic goiter have maintained that iodine is not only detrimental in cases of toxic adenoma, but is the cause of the disease.[2] Whether or not iodine may be the

1. Marine, David; and Lenhardt, C. H.: Bull. Johns Hopkins Hosp. **18**: 359-364, 1907; **22**: 217-219, 1911; Further Observations on the Relation of Iodine to Structure of Thyroid Gland in Sheep, Dog, Hog and Ox, Arch. Int. Med. **3**: 66-77 (Feb.) 1909; Effect of Administration or Withholding of Iodine-Containing Compounds in Normal Colloid or Actively Hyperplastic Thyroids of Dogs, ibid. **4**: 253-270 (Sept.) 1909; The Pathologic Anatomy of the Human Thyroid Gland, ibid. **7**: 506-535 (April) 1911; Pathologic Anatomy of Exophthalmic Goiter, ibid. **8**: 265-316 (Sept.) 1911.

2. "Iodine Hyperthyroidism" (Jackson, A. S.: Boston M. & S. J. **193**: 1138-1140 [Dec. 17] 1925) is not germane to our present discussion, since, according to the author, this condition is neither exophthalmic goiter nor toxic adenoma. It is worthy of note that in forty-nine of fifty cases tabulated by the author, the patients received iodine (quantity not stated) for an average period of 4.9 months each. It would be interesting to speculate as to the outcome in forty-nine patients with typical exophthalmic goiter (without adenomatous thyroids) receiving the same quantity of iodine for the same period of time, particularly if they were subjected to thyroidectomy shortly after a lapse and without resumption of the iodine before operation.

cause of toxic adenoma is immaterial in the present discussion, since it is possible to adduce evidence equally good and of comparable sort to indicate that iodine might play the same rôle in exophthalmic goiter. In the literature concerning the detrimental effects of the administration of iodine in cases of toxic adenoma, too little attention has been directed to the quantity of iodine taken or administered, in relation to the element of time. We know that this is a matter of decided importance in determining the clinical state of patients with exophthalmic goiter at a particular period in the course of the disease.

If exophthalmic goiter and toxic adenoma are two separate and distinct diseases, there might be reason for expecting opposite effects from iodine therapy, especially if exophthalmic goiter is considered an essential dysthyroidism (incomplete saturation of secretion by iodine) and toxic adenoma is considered a pure form of hyperthyroidism (secretion completely iodized). On the other hand, if exophthalmic goiter and toxic adenoma are different phases, degrees or variations of a single disease, the reaction to iodine should be of the same order in the two forms.

We have found no definite reference in the literature to the possible importance of comparing previously untreated patients with uncomplicated cases of both exophthalmic goiter and toxic adenoma, with regard to their reaction to iodine. This we believe to be a necessary procedure before accepting a reputed but unsubstantiated difference in reaction to iodine as a legitimate basis for the establishment of these clinical states as two diseases.

A careful consideration of what occurs in cases of classic exophthalmic goiter following the administration of iodine for the first time furnishes, we believe, a reasonable explanation for the reputed harmful effects of iodine in cases of toxic adenoma. It is well known that the administration of iodine to patients with exophthalmic goiter is followed by a striking clinical improvement and a decrease of the basal metabolic rate. If, after the period of maximal improvement, iodine is continued in the same quantities for a sufficiently long period of time, the clinical condition becomes aggravated and the basal metabolic rate increases and may return to its original level or even a higher level. If such a patient is not examined during the period of primary improvement but comes under observation during the period of secondary aggravation, iodine might be considered to have a causal relationship to the clinical state. The point to be borne in mind is that the patient has not been observed during the period of primary improvement.

In those patients with adenomatous goiter who come to the clinic in a well defined state of thyrotoxicosis, with a history of having taken iodine as a therapeutic measure or as iodized table salt and having been made worse thereby, do we not lack the very important observation of primary improvement, similar to that observed in cases of exophthalmic goiter, immediately following the institution of the iodine therapy? Are we not seeing such patients during a period of secondary aggravation which followed a period of primary improvement?

That there is a period of primary improvement in such cases is well borne out in our experience. In no *previously untreated* patient with clinical manifestations and state of the thyroid corresponding to what is commonly called toxic adenoma has there failed to be a definite clinical improvement and decrease of basal metabolic rate following the administration of iodine. In our experience, improvement has been quite as consistent in previously untreated patients with toxic adenoma as in previously untreated patients with exophthalmic goiter.

Under such circumstances, even if there were no other considerations, how can it be expected that we accept blindly the present general teaching that iodine is absolutely contraindicated as a measure preliminary to operation in cases of so-called toxic adenoma?

INDICATION FOR ADMINISTRATION OF IODINE

The condition of the thyroid gland itself determines our one and only indication for the administration of iodine to any patient with goiter. As long as the thyroid is hypertrophic and hyperplastic, iodine in proper quantities is indicated, irrespective of clinical grouping of patients and irrespective of the presence or absence of adenomas. When the thyroid is in a colloid or resting state (involution, not degeneration), there is no indication for iodine so far as thyroid function is concerned, and its ill advised use may be decidedly harmful.

We are thoroughly convinced that the well considered use of iodine, as a measure preliminary to operation, is not only safe but also beneficial in cases of so-called toxic adenoma as well as in cases of exophthalmic goiter. The ill effects of iodine are justly attributable to a lack of proper appreciation of the chief indication for its use and a lack of understanding of just what it may be reasonably expected to accomplish.

The questions of dysthyroidism and hyperthyroidism are so intimately involved with the response to iodine therapy as to merit a brief discussion of these hypotheses.

DYSTHYROIDISM AND HYPERTHYROIDISM IN EXOPHTHALMIC GOITER AND TOXIC ADENOMA

The term dysthyroidism is being used to imply the delivery to the general circulation of a product of thyroid secretion incompletely saturated with iodine that is considered toxic and responsible for the principal clinical phenomena of exophthalmic goiter.

Dysthyroidism, in the sense indicated above, seems to be based, in part at least, on the following considerations:

1. The thyroid is said to be in a state of overactivity, and is known to contain an abnormally low quantity of iodine, which is an essential constituent of the normal thyroid hormone. The overactivity is indicated by the increased vascularity and the hypertrophy and hyperplasia of the epithelial elements.

The objection to this assumption is that the thyroids of man and animals with simple endemic goiter may present the same indications of dysthyroidism, and yet the incompletely iodized products of secretion effect no such clinical manifestations as those occurring in cases of exophthalmic goiter.

2. A further assumption that in cases of exophthalmic goiter (dysthyroidism) the general circulation is being flooded by a toxic incompletely iodized product of secretion is based on the observation that patients with this disease to whom iodine is administered improve distinctly, and the benefit of such therapy is ascribed to saturation of the secretion by iodine.

That patients are thus benefited may be accepted as a fact, but this in itself, in view of equally important considerations to the contrary, does not establish that a toxic incomplete secretion is being saturated and rendered nontoxic.

If exophthalmic goiter is a pure form of dysthyroidism in the sense of an intoxication resulting from an overproduction of a perverted or incompletely iodized secretion and is greatly benefited by the administration of iodine, what explanation is there for the secondary aggravation of clinical symptoms and increase of basal metabolic rate that occurs when iodine is continued in the same quantities for a sufficiently prolonged period of time?

It might be urged that exophthalmic goiter (without adenomatous thyroid) is susceptible of conversion from a state of dysthyroidism into a state of hyperthyroidism by the administration of iodine. Even if future investigations prove this hypothesis well founded, so far as our present problem is concerned it is to be borne in mind that the conversion is brought about without the intervention of adenomatous thyroid tissue.

If toxic adenoma is a pure form of hyperthyroidism, in the sense of an intoxication resulting from an overproduction of a normal or completely iodized secretion, what essential difference is there between the state of a patient with this condition and the state of a patient with exophthalmic goiter during the period of secondary aggravation (induced hyperthyroidism) that results from the prolonged administration of iodine? So far as our present problem is concerned, we appear to be confronted with the dilemma that hyperthyroidism occurs in patients with adenomatous thyroids and in patients without adenomatous thyroids.

There is the alternative of assuming the simultaneous occurrence of two disease states, dysthyroidism and hyperthyroidism, in the case of exophthalmic goiter; there is certainly no excuse for denominating the second state (hyperthyroidism) as toxic adenoma, since the thyroid is not necessarily adenomatous. If we are at liberty to assume two diseases in the case of exophthalmic goiter, why may we not assume the same two disease states, dysthyroidism and hyperthyroidism, in the case of toxic adenoma? So far as alterations in the thyroid are concerned, we have found nothing inconsistent with the possible occurrence of dysthyroidism in toxic adenoma. It has been demonstrated in our own experience that there is a period of primary improvement following the administration of iodine in cases of toxic adenoma. This we have found to be the rule and not the exception in previously untreated patients. We have, therefore, at least one indication of dysthyroidism in cases of toxic adenoma quite as cogent as that which has been one of the chief supports of the view that exophthalmic goiter is an essential dysthyroidism; namely, primary improvement following the administration of iodine.

COMMENT

The matter presented in this paper represents the crystallization of a point of view which we have held for some years regarding certain aspects of the problem of toxic goiter. After the introduction of compound solution of iodine (Lugol's solution) by Plummer as a measure preliminary to operation in cases of exophthalmic goiter, and in view of the increasing tendency to recognize two types of toxic goiter as distinct diseases, it became necessary, in order to test the validity of our conceptions, to obtain data on the effects of the administration of iodine in the group of cases called toxic adenoma. Our first opportunity presented itself in July, 1924. Since then, our routine procedure has been the administration of compound solution of iodine as a preoperative measure in all cases, adenomatous and nonadenomatous, in which there was an increase of basal metabolic rate and other clinical evidence sufficient for a diagnosis of "thyrotoxicosis," provided an operation was to be performed.

We have regarded hypertrophy and hyperplasia of the thyroid as a sufficient indication for iodine in any case. When clinical evidence of hypertrophy and hyperplasia was not definite or was questionable, we have considered iodine to be indicated, provided the patient had not been taking iodine in large quantities or for a prolonged period of time immediately before coming under observation. Even if the patient had been taking iodine, the drug has not been entirely discontinued. Indeed, our experience is in accord with the observations of others, that the discontinuance of iodine for a time before operation is not a wise procedure.

Up to the present time, we have observed no untoward reaction from iodine other than slight aggravation following primary improvement in a few cases. As noted in the preceding discussion, we have observed comparable response to iodine in previously untreated cases of both exophthalmic goiter and toxic adenoma.

It is a matter of considerable importance to recognize that the quantity of iodine necessary to bring about the same or comparable clinical response and decrease of basal metabolic rate is much less in cases of toxic adenoma than in cases of exophthalmic goiter. This we attribute to the difference in degree of hypertrophy and hyperplasia of the thyroid in the two conditions. We emphasize this fact in order that any one who might be interested in this subject may avoid the mistake of administering large quantities of iodine for long periods of time to patients with thyrotoxicosis and slight degrees of hypertrophy and hyperplasia of the thyroid. Favorable response and unfavorable response are of the same character whether the thyroid is adenomatous or nonadenomatous. The present indications are that the thyroid can utilize iodine to the point of saturation without harmful effects to the patient. But beyond this point clinical experience shows that iodine may be harmful rather than beneficial, whatever may be the variety of toxic goiter treated.

CONCLUSIONS

1. We have been unable to recognize a single symptom or sign that is necessarily pathognomonic for exophthalmic goiter as opposed to toxic adenoma.

2. We have been unable to recognize a single anatomic or histologic alteration in the thyroid, in either the adenomatous or the nonadenomatous portion of the gland, that is necessarily pathognomonic for exophthalmic goiter as opposed to toxic adenoma.

3. There are equally good reasons for speaking of dysthyroidism in cases of toxic adenoma and exophthalmic goiter.

4. There are equally good reasons for speaking of hyperthyroidism in cases of exophthalmic goiter and toxic adenoma.

5. The degree of hypertrophy and hyperplasia of the thyroid determines the quantity of iodine that will be tolerated, without untoward effects, in both exophthalmic goiter and toxic adenoma.

6. The reaction to iodine is fundamentally the same in cases of exophthalmic goiter and toxic adenoma.

7. We have no alternative but to regard exophthalmic goiter and toxic adenoma as clinical variations of a single morbid state.

HIGH JEJUNOSTOMY IN INTESTINAL OBSTRUCTION

A CLINICAL REVIEW AND EXPERIMENTAL RESULTS *

THOMAS G. ORR, M.D.
AND
RUSSELL L. HADEN, M.D.
KANSAS CITY, KAN.

Since the writings of Victor Bonney,[1] considerable interest has been manifested in jejunostomy as a treatment of acute intestinal obstruction and paralytic ileus. It has been advocated especially in those severely toxic cases in which a more radical operation to relieve obstruction would be dangerous to life. Bonney writes:

> I hold strongly that all cases of paralytic intestinal obstruction (whether primary or secondary to an organic obstruction or to peritonitis), when advanced to the stage of fecal, or short of fecal, intestinal vomiting, should be treated by jejunostomy. By making an opening into the jejunum in a case of fecal or intestinal vomiting, the source of the vomit is directly tapped and free drainage of the toxic material is established. No patient should be allowed to die with fecal vomiting if it is possible to perform this operation. Its effect in many cases has been remarkable; in all of them there has been an immediate cessation of vomiting, and all the patients have recovered.

Handley [2] is somewhat doubtful about the value of jejunostomy, and advises jejunocolostomy with cecostomy. Rankin [3] thinks that, in some cases of severe acute peritonitis, jejunostomy will find a field of usefulness. McKinnon [4] is an enthusiastic advocate of jejunostomy in acute intestinal obstruction and peritonitis. He also uses it with other abdominal operations to prevent postoperative ileus and vomiting. Under such conditions he terms it complemental jejunostomy. Lee and Downs [5] state that jejunostomy should be used, alone or in combination with other procedures, in all cases of acute mechanical intestinal obstruction of more than twenty-four hours' duration. Summers [6] advises draining the small bowel as high up in the jejunum as recognizable when vomiting has reached the fecal odor stage. Walker,[7] Taylor,[8] Wilkie [9] and C. H. Mayo [10] recommend jejunostomy in obstruction of the bowel. Many surgeons emphasize the value of enterostomy in ileus, but do not urge jejunostomy.

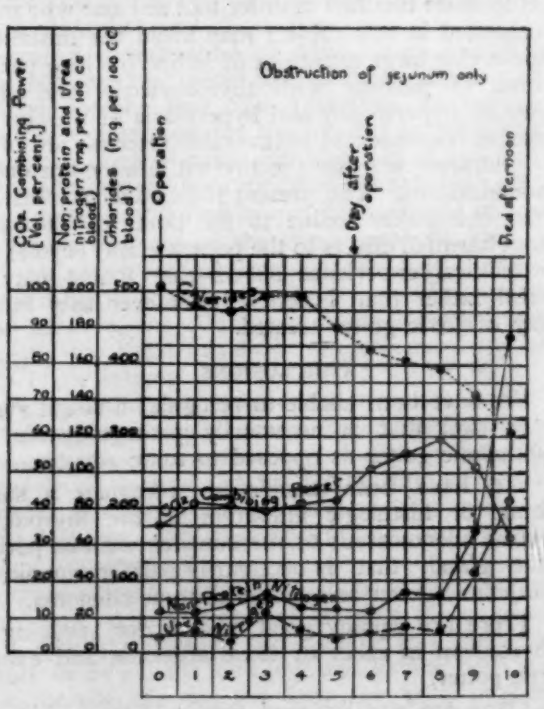

Chart 1.—Changes in the chemical reaction of the blood after obstruction of the jejunum 12 inches below the ligament of Treitz.

During the last three years we have been much interested in the chemical changes of the blood occurring in pyloric [11] and high intestinal obstruction,[12] and the relation of these changes to sodium chloride therapy.[13] These conditions show a constant rise in the nonprotein nitrogen and urea nitrogen, a fall in the chlorides, and a rise in the carbon dioxide combining power of the plasma. Following these observations, experimental jejunostomy [14] was tried to compare its therapeutic effect with that observed after the administration of sodium chloride and to determine, if possible, why jejunostomy is considered of clinical value in the treatment of intestinal obstruction.

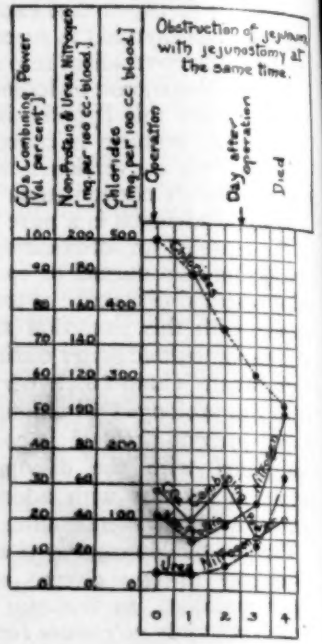

Chart 2.—Obstruction of the jejunum and jejunostomy at the same time: a rapid fall in chlorides and rise in nonprotein and urea nitrogen.

In a series of experiments on dogs, we have studied the effect of jejunostomy on the chemical changes of the blood and the length of life following high obstruction of the jejunum. Also combined jejunostomy and teratment with sodium chloride was studied. Obstructions were produced under ether anesthesia by sectioning the intestine from 10 to 12 inches below the ligament of Treitz and inverting the cut ends with purse string sutures. All secondary jejunostomies were done under local anesthesia; 0.5 per cent procaine was used. The technic of jejunostomy was a modified Witzel operation with an omental covering sutured over the area. A small rubber tube was used, and in every instance the drainage through the tube was prompt and continuous. Water was permitted by mouth ad libitum. Blood for analysis was withdrawn daily from the jugular vein until the death of the animal. The nonprotein nitrogen,

* From the University of Kansas School of Medicine.
* Read before the Section on Surgery, General and Abdominal, at the Seventy-Seventh Annual Session of the American Medical Association, Dallas, Texas, April, 1926.

1. Bonney, Victor: Brit. M. J. **1**: 583 (April 22) 1916.
2. Handley, W. S.: Brit. M. J. **1**: 519 (April 8) 1916.
3. Rankin, F. W.: Kentucky M. J. **21**: 256 (May) 1923.
4. McKinnon, A. I.: Jejunostomy, J. A. M. A. **77**: 273 (July 23) 1921.
5. Lee, W. E., and Downs, T. M.: Ann. Surg. **80**: 45 (July) 1924.
6. Summers, J. E.: Ann. Surg. **72**: 201 (Aug.) 1920.
7. Walker, I. J.: Boston M. & S. J. **186**: 108 (Jan. 26) 1922.
8. Taylor, W.: Brit. M. J. **2**: 993 (Nov. 28) 1925.
9. Wilkie, D. P. D.: Brit. M. J. **2**: 906 (Nov. 28) 1925.
10. Mayo, C. H.: The Cause and Relief of Acute Intestinal Obstruction, J. A. M. A. **79**: 194 (July 15) 1922.
11. Haden, R. L., and Orr, T. G.: J. Exper. Med. **37**: 377 (March) 1923.
12. Haden, R. L., and Orr, T. G.: J. Exper. Med. **37**: 365 (March) 1923.
13. Haden, R. L., and Orr, T. G.: J. Exper. Med. **38**: 55 (July) 1923.
14. Haden, R. L., and Orr, T. G.: J. Exper. Med. **43**: 483 (April) 1926.

urea nitrogen, chlorides and carbon dioxide combining power were studied. Any animal showing a complication at necropsy was rejected.

EXPERIMENTAL OBSERVATIONS

Five animals with simple obstruction of the jejunum lived from five to nineteen days. The chemical changes of the blood were similar to those noted in duodenal obstruction, but developed less rapidly. The carbon dioxide combining power showed an increase, but not the marked rise observed in obstruction of the duodenum and pylorus (chart 1).

Average Length of Life in Each Series of Five Dogs

	Days
1. Obstruction of jejunum only (controls)	10
2. Obstruction of jejunum with jejunostomy at same time	3½
3. Obstruction of jejunum, jejunostomy and sodium chloride therapy at same time	5½
4. Obstruction of jejunum with jejunostomy later	9
5. Obstruction of jejunum with jejunostomy and sodium chloride therapy later	13½
6. Simple jejunostomy 10 inches below ligament of Treitz	3⅗

In a second series of five animals in which obstruction of the jejunum and jejunostomy were done simultaneously, the length of life varied from three to five days. The chemical changes of the blood developed rapidly, and were typical of those found in high intestinal obstruction (chart 2).

Animals subjected to obstruction of the jejunum and jejunostomy simultaneously and treated with sodium

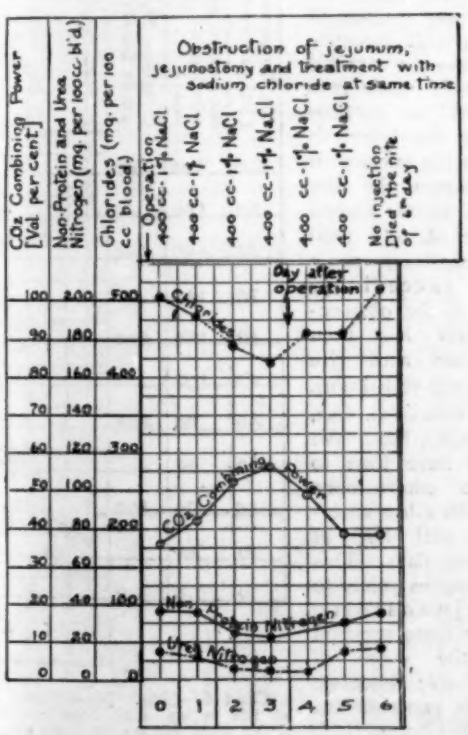
CO2 Combining Power (Vol. per cent.)
Non-Protein and Urea Nitrogen (mg. per 100 c.c. blood)
Chlorides (mg. per 100 c.c. blood)
Obstruction of jejunum, jejunostomy and treatment with sodium chloride at same time
Operation
400 cc. 1% NaCl
Day after operation
Chlorides
CO2 Combining Power
Non-Protein Nitrogen
Urea Nitrogen
0 1 2 3 4 5 6

Chart 3.—Same as chart 2, with sodium chloride treatment started the day after operation. This should be compared with charts showing no treatment.

chloride solution from the beginning of the experiment lived from three to twelve days. They did not show the chemical changes in the blood characteristic of jejunal obstruction. The administration of sodium chloride solution apparently prevented such changes (chart 3).

In five dogs with obstruction of the jejunum, jejunostomy was done after the development of a toxemia. The duration of life in the group varied from four to thirteen days. The animals developed the characteristic blood changes of simple jejunal obstruction (chart 4).

In the next series of five dogs, jejunostomy was done after the onset of the toxemia of jejunal obstruc-

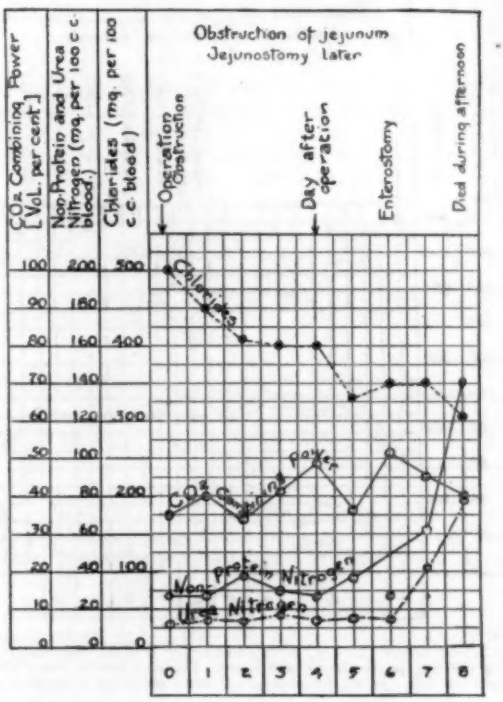

Chart 4.—Obstruction of jejunum with jejunostomy after development of toxemia; drainage of jejunum without apparent effect on the progress of blood chemical changes.

tion. Sodium chloride was given after jejunostomy in sufficient quantity to keep the blood chlorides within normal limits. These animals did not develop the chemical changes of the blood characteristic of obstruction of the jejunum, and lived from thirteen to eighteen days (chart 5).

It was found in these experiments that animals having obstruction of the jejunum and jejunostomy together lived a shorter time than those having obstruction alone. This suggested the study of the effect of simple jejunostomy with the interesting observation that six dogs lived only from two to five days following the operation (chart 6). All of these dogs showed a decrease in the blood chlorides and a rapid rise in urea and nonprotein nitrogen. These findings are similar to those reported by Walters, Kilgore and Bollman [15] in experimental duodenal fistula in dogs. Their animals lived from three to four days after duodenostomy.

The danger of duodenal fistula in patients has long been known. In a series of twenty-eight cases collected by Cameron,[16] the mortality was 43 per cent, a death rate equal to that of acute intestinal obstruction.

COMMENT

The average duration of life in experimental obstruction of the upper jejunum is somewhat longer than that following obstruction of the duodenum. Simple

15. Walters, Waltman; Kilgore, A. M., and Bollman, J. L., Changes in the Blood Resulting from Duodenal Fistula, J. A. M. A. **86**: 186 (Jan. 16) 1926.
16. Cameron, A. L.: Surg. Gynec. Obst. **37**: 599 (Nov.) 1923.

drainage of the jejunum results in death more quickly than simple obstruction of the jejunum. In the treatment of experimental jejunal obstruction, jejunostomy not only does not prolong but seems to shorten life. Jejunostomy also does not prevent the development of the characteristic chemical changes of the blood that occur in jejunal obstruction.

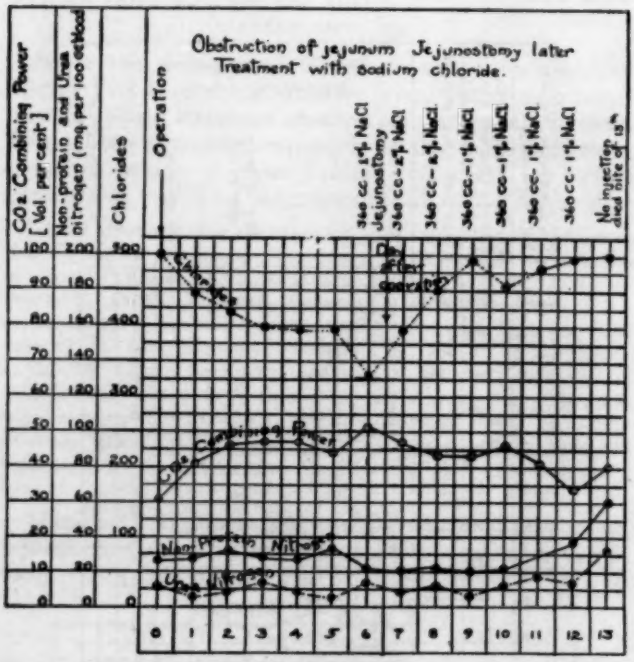
Obstruction of jejunum Jejunostomy later
Treatment with sodium chloride.
CO2 Combining Power (Vol. per cent.)
Non-protein and Urea nitrogen (mg per 100 cc blood)
Chlorides
Operation
Jejunostomy
Died after operation
Non-Protein Nitrogen
Urea Nitrogen
Chlorides
0 1 2 3 4 5 6 7 8 9 10 11 12 13

Chart 5.—Same as chart 4, with addition of sodium chloride treatment beginning the day jejunostomy was done. The changes in blood chemistry and length of life should be compared with previous charts.

When these experimental findings are compared with the clinical reports of the value of jejunostomy for intestinal drainage, one hardly knows how to draw conclusions properly. It is possible that the patient does not react like the animal to jejunal drainage. It may also be possible that temporary jejunal drainage is clinically without danger, whereas continuous drainage might result in death. More accurate clinical observations must be made to settle this point.

In presenting these experimental observations, it is not the intention to advise against jejunostomy in the treatment of ileus but to stimulate an effort to determine its true value or danger.

CONCLUSIONS

1. The chemical changes of the blood characteristic of acute obstruction of the jejunum in the dog are not prevented by jejunostomy.

2. Jejunostomy following experimental obstruction of the jejunum has no beneficial effect on the duration of life. Our observations indicate that life may be shortened by early jejunostomy.

3. Treatment of jejunal obstruction with sodium chloride solution tends to prolong life in animals, regardless of jejunostomy.

4. Animals with simple jejunostomy die more quickly than those with obstruction of the jejunum.

5. With the well known danger of duodenal fistula and the rapid death of animals following experimental jejunostomy in mind, we believe that the clinical value of jejunal drainage for obstruction of the small intestine is yet to be proved.

Forty-Seventh Street and Millcreek Parkway.

ABSTRACT OF DISCUSSION

DR. J. SHELTON HORSLEY, Richmond, Va.: There are so many different problems in intestinal obstruction, some of which have not yet been entirely solved, that a consideration of the subject is always interesting. The work of Foster and Hausler, who have differentiated obstruction into that type in which there is no material interference with the circulation of the bowel and no gangrene, but simple mechanical obstruction, and into the second type in which there is volvulus or gangrene, is valuable. In the second type the symptoms and prognosis are entirely different from those in which there is simple mechanical obstruction, because the injured bowel gives off products similar to those that produce shock. This experimental work of Orr and Haden is important. The fact that dogs die from an enterostomy done high in the jejunum, however, does not mean that an enterostomy low in the ileum in clinical cases of obstruction is without benefit. One of the chief causes of death in high obstruction is dehydration, and naturally high enterostomy or high obstruction drains the body of water very quickly. Another important feature that has been worked out by Orr and Haden is the loss of chlorides in high obstruction. It seems to me that the clinical conclusion to be drawn from this experimental work is that an enterostomy should be made as near the point of obstruction as possible, and not high up in the jejunum by choice, and that it should be made by some technic in which a rubber catheter is inserted obliquely in the intestinal wall so that the drainage from the bowel can be checked by clamping the catheter. Such an enterostomy in which the bowel can be dropped back just beneath the parietal peritoneum will permit the withdrawal of the catheter in about a week or ten days, with little if any leakage of the intestinal contents. If, however, a straight incision is made into the bowel or particularly if the bowel is fixed on the surface of the abdomen, the flow of fecal matter cannot be checked, and such an enterostomy may become exceedingly serious if the obstruction later has been overcome and the enterostomy still drains.

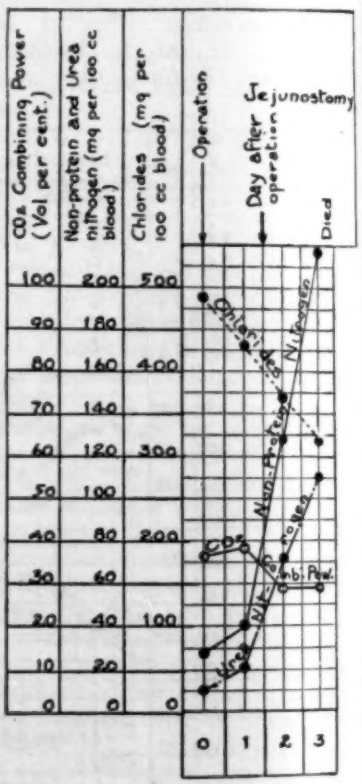

Chart 6.—Simple jejunostomy: length of life in six dogs, from two to five days; rapid changes in blood chemistry.

DR. THOMAS G. ORR, Kansas City, Mo.: We did not have time to go into enterostomy. Dogs with a low enterostomy will live at least forty days. This report applies solely to high jejunostomy. There is some question about the value of jejunostomy; hence we offer this experimental work in comparison with clinical experience to stimulate an interest in determining just what danger there may be in doing a jejunostomy. We believe in ileostomy in the treatment of these conditions. As regards the water and chloride, we think the chloride is extremely important. It seems that there is still another factor to be considered in the drainage of the upper intestinal tract besides these two. We have supplied water and chlorides enough to replace the daily loss of weight, but still that does not prevent the death of the animal in a relatively short time.

AN OUTBREAK OF POLIOMYELITIS

APPARENTLY MILK BORNE *

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Health Officer
CORTLAND, N. Y.

E. S. GODFREY, JR., M.D.
Director, Division of Communicable Diseases, New York State Department of Health
ALBANY, N. Y.
AND
W. L. AYCOCK, M.D.
Associate in Preventive Medicine and Hygiene, Medical School of Harvard University; Director of the Research Laboratory, Vermont Department of Public Health
BOSTON

From Dec. 14 to Dec. 25, 1925, there developed in the city of Cortland, N. Y., eight cases of poliomyelitis. All the patients were found by one of us (A. C. K.) to have consumed milk from the same dealer, Mr. G. December 7, seven days before the onset of the first case of this group, a 16 year old boy (case 1) who was working on the dairy farm where the bulk of G.'s milk was produced, became sick with headache, pain in the back and some diarrhea. He vomited and felt feverish but continued at work, milking from eight to ten of the twenty cows on the dairy, though he noticed that his hands were growing progressively weaker, with pain and tenderness in his left arm. On the morning of December 11, after milking three or four cows, he gave up work on account of paralysis of the left upper extremity and was taken to his home in Cortland, where he was seen by his physician, who made a diagnosis of poliomyelitis. This boy had been employed on the dairy farm since Sept. 22, 1925, but visited his home in Cortland practically every Saturday night.

Prior to this apparently milk-borne outbreak there had been what was probably a fulminating case of poliomyelitis (case A) in the town of Virgil, 8 miles from Cortland, and three cases of poliomyelitis in Cortland (cases B, C and D). Three of these four patients had onsets on the same day, October 7, the fourth on October 8, and three of them died. Although the three cases in Cortland itself were all in the eastern half of the city, the two nearest each other (cases C and D, fig. 2) were separated by a distance of approximately one-half mile.

Apart from the cases included in this report, no other cases have been reported in the immediate vicinity of Cortland during 1925, the nearest case being in Groton, 10 miles west. This patient had the onset, September 16, developed bulbar paralysis, and died, September 19. There had also been three cases in the town of Cuyler, 16 miles northeast, two cases in one family—mother and child—the third five days after contact with them. So far as known, neither the Groton nor the Cuyler cases had any connection with those in Cortland. The most recent previous case in the city of Cortland itself was in August, 1924.

During this outbreak no cases occurred which could reasonably be suspected as abortive or nonparalytic cases except in the family of patient D of the October group. About a month after the death of patient D, a 3 year old sister had a high fever, severe vomiting, and complained of pain when lifted. Examination, January 5, failed to elicit any evidence of paralysis. One case was reported, December 26, which, in our opinion, was torticollis. The outbreak naturally caused a great deal of concern on the part of the public, and it is reasonably certain that any considerable number of abortive or suspicious cases would have come to light had they existed. This statement agrees with the opinion of ten or twelve physicians in Cortland with whom we discussed the question, and is borne out by the house to house canvas by nurses who made the census of milk supply.

OCTOBER CASES

CASE A.—A boy, aged 8 months, was taken suddenly ill, early in the morning of October 8, with diarrhea and vomiting. He was seen by a physician at 9 a. m., at which time the baby was restless, the eyes were sunken, the rectal temperature was 101 +, the lungs were filled with mucus, and the breathing was short and rapid. Vomiting was projectile in character. He developed convulsions about 4 p. m. that day and died at 5:30. The head was "thrown somewhat back and was rotating from side to side with a fairly constant motion." The cause of death was certified as acute meningitis, though the attending physician states that the diagnosis was very uncertain.

CASE B.—A boy, aged 11 years, was taken ill, October 7, developed bulbar paralysis October 9, and died that day. He was an inmate of a children's home caring for approximately forty children, aged from 3 to 15 years. He attended school no. 1, and was in the fifth grade. He had not been out of town. There is more or less constant visiting of the children in this institution by their parents from Cortland and the surrounding country. None of the other children in the home were sick. Milk at this institution was obtained from their own cows and occasionally from Dealer X.

CASE C.—A girl, aged 5 years, became ill, October 7, and developed paralysis of the left upper extremity, October 10. She had one sister, aged 13, who was not sick either before or afterward. She attended the kindergarten in school no. 2, lived in a boarding house on the second floor, had not been out of town, and did not associate with either of the other two patients in this series. Her mother sold tickets in the moving picture theater patronized by patient 1 of the December series. Milk was obtained from Dealer Y.

CASE D.—A boy, aged 20 months, became ill, October 7. He showed paralysis of the left foot, October 9; there was bulbar involvement, October 11, on which day he died. He had not been out of town; he played with various children in the neighborhood, but not, so far as could be ascertained, with any of the other patients. He had two brothers, aged 4 and 2, and four sisters, aged 9, 7, 5 and 3 years. About the first week in November the girl, aged 3 years, had a high fever and severe vomiting, and complained of pain when lifted. Examination, January 5, failed to elicit any weakened muscles. Older children of the family attended school no. 2. Milk was obtained through a grocery store from Dealer Z.

DECEMBER CASES

CASE 1.—A boy, aged 16, became ill, December 7; there was paralysis, December 11. His symptoms have already been noted. Examination, January 5, showed complete paralysis of the left upper extremity except the finger flexors, only a trace of contraction in the right triceps, marked weakness of the right deltoid and biceps, and some weakness of both right and left peroneals. For about two months prior to the onset he had been working on the dairy farm of his uncle, Mr. P., 1½ miles northeast of the city. He milked from eight to ten cows as usual during the period from Dec. 7 to Dec. 10, 1925. He milked three cows with the right hand only, December 11. He visited his mother's home in Cortland about one block distant from patient C every Saturday evening, and had been to a moving picture show where the mother of patient C sold tickets, November 28 and December 5. He is quite certain that he had not been in direct contact with patient C or her sister at any time. His sister stated that she was acquainted with the sister of patient C and had been with her on one or

* From the Division of Communicable Diseases of the New York State Department of Health.

* Participation in this study was made possible by the support of the Harvard Infantile Paralysis Commission, and by a fund privately donated to the Vermont Department of Public Health.

two occasions since patient C's recovery; but the latter statement is doubtful. The boy was a mental defective and had been an inmate of the Rome State School. His sister also showed evidence of mental defect.

CASE 2.—A boy, aged 15 months, became ill on the evening of December 14, with moderate fever, moderate to severe headache, slight constipation, retraction of the head, and drowsiness. Resistance to anterior flexion of the spine was not noted. He vomited, December 18. He was paralyzed in both arms and both legs, December 18. The family had been in Cortland only since December 2, coming from Pennsylvania by automobile. He was the only child in the family; he lived with the father and mother in two rooms upstairs, and there was a family of two adults and one child, aged 9, downstairs. The house was not far from the children's home where patient B died six weeks before their arrival in Cortland. Each family in this house took 1 quart of G.'s milk daily. The baby and father both drank milk, the baby about one cupful daily. The 9 year old child downstairs also drank one cup daily, but had no symptoms except a slight cold about December 7. There had been no known contact, direct or indirect, with any of the other patients in the city or elsewhere. The child downstairs attended school 1, grade 4-B.

CASE 3.—A man, aged 22, living in a rooming house in the city, became ill at noon, December 16. Paralysis of the ascending type appeared December 18, with death occurring that night from bulbar involvement. The patient drank milk three times daily at a restaurant which was supplied with 35 quarts of G.'s milk each day. So far as known, he had been in contact with no other patients. He lived about half a block distant from patient 8, who became ill, December 25, and the block in which the rooming house was situated was immediately back of that of patient 6, although on the street farthest removed from him.

CASE 4.—A girl, aged 2, the youngest of a family of six, including two adults and three boys, aged 9, 7 and 4, had not previously been ill but was not a well nourished looking child. She was paralyzed in both arms, December 19; it was noticed that the right leg also was paralyzed, December 21. The family took 2 quarts of G.'s milk daily, which the child drank rarely, though she used it on cereals every day. All the other children in the household drank a cupful every morning. The boy, aged 7, was very fond of it and drank more. No others in the household were sick at any time. The father, who was a laborer, had not been to any place from which poliomyelitis had been reported. The family occupying the other side of the house in which the patient lived—consisting of three children of school age and two adults—used 2 quarts of the same milk daily, but none of them were sick. The brothers attended school 3.

CASE 5.—A girl, aged 3, previously in good health except for a slight indisposition, December 11, when she was drowsy, was pale about the mouth and had no appetite, became ill, December 18. Spinal puncture was performed on the evening of December 19, the cell count being about 100. Paralysis developed, December 20, in both upper extremities. The father was a garage mechanic. The family took 1 quart of G.'s milk daily, of which this child probably drank less than two glasses during the period from December 7 to December 11. The family consisted of two adults and one other daughter, aged 1. The 1 year old child drank as much milk as the one attacked.

CASE 6.—A boy, aged 11, became ill, December 18, with general malaise, but no definite symptoms. He stayed home from school and remained in bed. He was apparently well, December 19. December 20, on return from Sunday school about 1 p. m., he complained of slight headache and vomited. December 21, it was noticed that he had difficulty in swallowing. Mucus and saliva collected in his throat which he was unable to cough up. Death occurred from respiratory paralysis about 3 a. m., December 22. The father was in charge of the wet wash of a steam laundry. There were no other children. This family did not use G.'s milk, but it was learned a day or two after his death that he was at a party, December 12, which was attended by about thirty persons, both adults and children. Five quarts of G.'s milk were used at the party, and though most of it was used by adults in coffee, the boy drank two glasses of it. He attended school 2, grade 5.

CASE 7.—A boy, aged 17, became ill about 4 p. m., December 19, with high fever, severe frontal headache, constipation, vomiting, pain in the back, and stiffness of the neck, jaws and legs. When examined, December 21, there was no retraction of the head, and very slight if any resistance to anterior flexion of the spine. Otherwise the examination was apparently negative, although the muscles were not tested at that time. He was reexamined, January 6, and found to have marked weakness of both masseter muscles, of the left triceps and moderate paresis of the right and left hamstrings and left anterior tibial group. The family consisted of two adults and three other children, all girls, aged 13, 4 and 2 years. The two younger children had also been sick—the younger attacked, December 14, with slight fever, pain and tenderness in the right arm and leg, afterward shifting to the left elbow and wrist. December 21, the left wrist and left ankle were swollen and edematous, and there was pain on motion. The child had a vulvovaginitis of some two or three weeks' standing. It was thought that she might be paralyzed because of inability or unwillingness to roll over in bed. It is believed, however, that this was because of the pain associated with movement of the affected parts. Her sister, aged 4, also had vulvovaginitis; she had no symptoms except pain and tenderness in the left shoulder. While at Sunday school, December 20, the teacher noticed that she had difficulty in getting the left arm into the coat sleeve. Reexamination of both these children, December 22 and 23, showed no evidence of paralysis but decided evidence of arthritis in the younger child. The child, aged 4, had in the meantime apparently recovered. Examined again, January 5, there was still evidence of arthritis in the child, aged 2, none in the child aged 4, nor was there any evidence of muscle weakness found in either one. The boy aged 17, as well as the father of this family, worked in a factory where G.'s milk was sold to the extent of 75 quarts daily. Three quarts of the milk were also taken at the house. The boy drank the milk at home and from a pint to a quart of it daily at the plant. The parents and the other children in the family drank milk, as well as using it on cereals. There was no known contact with other cases. The child aged 13 attended school 1, grade 5-B.

CASE 8.—A boy, aged 7, who lived about half a block from patient C, though so far as could be ascertained he had never been in contact with her, became ill, December 25, in the afternoon. He was found to be paralyzed, December 29. The spinal fluid cell count was 34. He was one of a family of eight, consisting of two adults, two brothers, aged 8 and 4 years, and three sisters, aged 10 years, 6 years and 8 months. The family took 2 quarts of G.'s milk daily. The patient drank more of it than any of the others. He attended a morning show for children, December 19, at the theater where patient C's mother sold tickets. Otherwise there was no history of direct or indirect contact. He attended school 2, grade 2-B.

CASE 9.—A boy, aged 19, became ill, December 25; paralysis was noted, December 28, of both arms and both legs except the toe and finger flexors. December 28, the spinal fluid cell count was about 100 cells. The family consisted of two adults, the patient and a brother, aged 7. The patient was a teamster. The house was about half a block distant from that of patient 3; they were not acquainted. Aside from the fact that he removed ashes from the laundry adjoining the house of patient 6 and had seen and probably spoken to the father of patient 6 while doing so, he gave no evidence of direct or indirect contact with any other patient. The family did not take G.'s milk. The mother, however, worked in the restaurant previously referred to in connection with case 3. She drank milk there occasionally and at times brought home articles of food for family consumption. Among these, rice and bread puddings made with G.'s milk sometimes figured. She also took food which came back from the tables uneaten, and there is the possibility that she took home some food left uneaten by patient 3. The younger brother visited the restau-

rant frequently and usually drank two or three glasses of milk—often twice daily—and had not been sick.

CASE 10.—A girl, aged 6, became ill, December 26, with slight fever. The following day she had moderate headache and epigastric pain. She had been sleeping near an open window; the neck was stiff and the head was held with the chin toward the left shoulder, resisting movement in any direction. December 29, the spinal fluid cell count was said to have been between 300 and 400, with increased pressure. She did not develop paralysis. Examination, January 6, was negative, except for a slight weakness of the left sternomastoid muscle. The family consisted of the father, mother and one servant, in charge of Salvation Army headquarters; she had not been in contact with any other patient. The only connection between this child and any of the others was the fact that the Christmas packages that were being collected at the Sunday school attended by patient 6, December 20, were subsequently delivered to the home of patient 10 in the Salvation Army headquarters. The child had not at any time consumed milk from dealer G. The case may be regarded as probably one of torticollis.

TABLE 1.—*Epidemiologic Data*

Case	Age	Sex*	School Attended	Paralyzed	Fatal	Date of Onset	Contact with Previous Case: Direct	Contact with Previous Case: Indirect	Dealer G. Milk
A	9 mo.	♂	None.....	P	+	Oct. 7/8	0	0	0
B	11 yr.	♂	Sch. 1, gr. 5..	P	+	Oct. 7	0	0	0
C	5 yr.	♀	Sch. 2, kindergarten.....	P	..	Oct. 7	0	0	0
D	20 mo.	♂	None.....	P	+	Oct. 7	0	0	0
1	16 yr.	♂	None.....	P	..	Dec. 7	0	+	+
2	15 mo.	♂	Child downstairs, sch. 1	P	..	Dec. 14	0	0	G+
3	22 yr.	♂	None.....	P	+	Dec. 16	0	0	G+
4	2 yr.	♀	Bros. sch. 3..	P	..	Dec. 16	0	0	G+
5	3 yr.	♀	None.....	P	..	Dec. 18	0	0	G+
6	11 yr.	♂	Sch. 2, gr. 5..	P	+	Dec. 18	0	0	G+
7	17 yr.	♂	Sis. sch. 1, gr. 5B.....	P	..	Dec. 19	0	0	G+
8	7 yr.	♂	Sch. 2, gr. 2B	P	..	Dec. 25	0	+	G+
9	19 yr.	♂	Bro. sch. 3 ?..	P	..	Dec. 25	0	+	G+?

* In this column, ♂ indicates male; ♀, female.

The chronology of this outbreak may be seen in table 1, which gives the salient epidemiologic features of the cases. The simultaneous occurrence of the four October cases in the city suggests a common source of infection, but we were unable to find anything in common. There was no evidence of direct or indirect contact. None of the patients had at any time used the milk supply in question, nor did they use the same milk supply.

The explosiveness of the December group again suggests a common source of infection. They all used the same milk supply. In no instance was there a history of direct contact with a previous case. There were, however, the following instances of indirect contact:

The dairy farmer concerned in the epidemic, his wife, and his daughter, aged 6 years, attended the funeral of patient A, who was a niece, October 10. The boy, patient 1, though working on the P. farm at the time, did not accompany them. The P. family spent several hours at the house in Virgil, taking one meal while there. They deny any illness even of a minor nature. There was no subsequent visiting between these two families. Patient 1 also attended the theater where the mother of patient C of the October group sold tickets.

The mother of patient 8 worked in the restaurant where patient 3 took his meals.

Patient 9 attended a morning motion picture show, December 19, six days before the onset of his illness. The mother of patient C sold tickets at this theater.

These are the only instances of possible indirect contact that could be found.

MILK

Patients 2, 4, 5, 7 and 9 were in families of regular customers of dealer G. Patient 7 also drank from a pint to a quart of dealer G. milk for lunch at an automobile factory. Patient 3, living in a rooming house, drank milk three times a day in a restaurant supplied with 35 quarts a day by dealer G. The family of patient 6 did not take milk of dealer G. but attended a party on the night of December 12, where patient 6 drank two glasses of milk which was obtained from dealer G. for the occasion. Dealer G. did not supply milk to the home of patient 8, but the mother worked in the restaurant referred to in connection with case 3. She handled the milk in the restaurant and frequently drank it. She made a practice of bringing food home from the restaurant for family consumption. She did not remember bringing raw milk home, but often brought such things as bread and rice puddings which had been prepared with dealer G. milk. She also took food which came back from the tables in the restaurant.

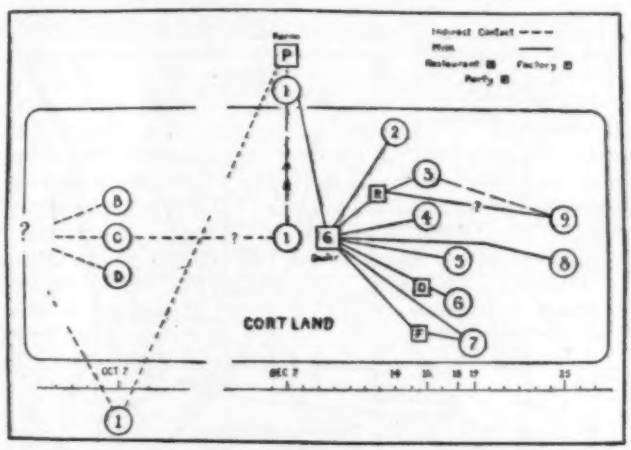

Fig. 1.—Epidemiologic relationship between the cases.

Figure 1 shows the epidemiologic relationship between the cases in this outbreak, as indicated by the information we were able to collect.

The total daily milk supply of Cortland is approximately 5,700 quarts, of which dealer G. sold an average of 245 quarts, or about 4 per cent of the total. His milk was not pasteurized. All of the milk from dairy P., about 215 quarts daily, was sold to dealer G. whose other regular source of supply was dairy W. Dealer G. purchased W.'s entire product, amounting to about 30 quarts daily, and occasionally pieced out his supply with small amounts obtained from other dealers. During the week of December 7 he purchased about 40 quarts on two occasions from dealer A., who sells from 400 to 500 quarts daily in the city and among whose customers no cases of poliomyelitis appeared.

Each morning dealer G. received his milk in 40-quart cans from the sources mentioned, consisting of milk of the same morning and of the previous night. Dairy W. furnished only from 30 to 40 quarts, but the night's and morning's milk were delivered to the dealer in separate cans. The milk from the different dairies was bottled at the same time, but the older milk (i. e., that of the previous night) was always bottled first, and after the bottling machine had been cleansed, the morning's milk was bottled.

At about 3 p. m., dealer G. began his first delivery, loading his wagon with the older milk and following

the route shown in figure 2. Among the patrons on this route was restaurant W., which took 35 quarts. After making this delivery he returned to his plant, reloaded with morning's milk and what was left over from the first delivery, and made a second delivery, as shown in figure 2. On this delivery he made a point of loading his wagon so that the night's milk left over from the first delivery, amounting to less than 12 quarts, would be delivered first. The first house on this second delivery was that of patient 8. The morning's milk remaining, approximately 75 quarts, was delivered in pint bottles about 8 a. m., the following day to the workmen in an automobile factory for their lunches (compare case 7). It will thus be seen that the first delivery consisted entirely of night's milk while the factory delivery and the second delivery, with the exception of the first houses, was morning's milk.

Figure 2 also shows the relation of the dealer G. milk deliveries to the cases in this outbreak. As will be seen, all the cases appear on, or are traceable to, the first delivery, which consisted of night's milk, with the exception of patient 8, who, as has been explained, lived in the first house reached on the second delivery and would receive any night's milk left over from the first delivery.

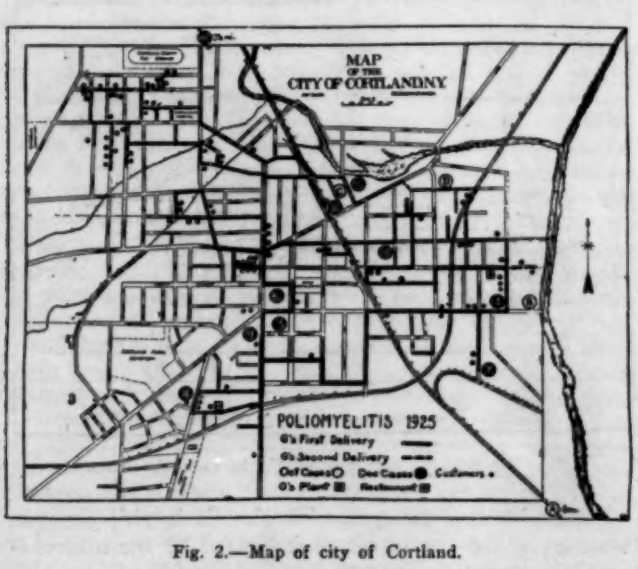

Fig. 2.—Map of city of Cortland.

It therefore appears that all of the cases, with the exception of case 6, are traceable (one indirectly) to the delivery of night's milk. This, it is believed, indicates that only the night's milk coming from the P. dairy farm happened to be contaminated by patient 1, perhaps on only one occasion. Since patient 6 only drank dealer G.'s milk on the night of December 12, some pains were taken to determine exactly what milk he drank. After a careful rehearsal of dealer G.'s handling of milk, it seems that in the ordinary course of events, this milk would have been of the morning of December 12. However, in view of the fact that this milk was called for at dealer G.'s plant, was in quart bottles, and was taken from the cooler, it was quite certainly left over from some previous delivery and possibly could have been some of the night's milk of December 10, the last night on which patient 1 handled dairy P. milk. If the milk was contaminated on the night of December 10 only, the incubation period of the first case of the suspected milk-borne group would be as short as three days, and of the last case, fourteen days.

GEOGRAPHIC DISTRIBUTION

With the exception of cases 3, 6 and 9, each of the December cases was fairly remote from the others of that series. Considered in conjunction with the October cases, two other instances of geographic association are found, cases B and 2, and cases C, 1 and 8. It should be remembered that patient 2 did not come to Cortland until December 2, whereas patient B died October 11; also that patient 1 spent only Saturday nights at the location indicated on the map.

With regard to each of these groups, it can be said with certainty that contact between the different members was not intimate, that their acquaintance with one another, if it existed at all, was of the slightest, and that so far as could be ascertained they had no intimates in common.

The fact that no cases occurred in the northwestern section of the city despite the large number of customers G. had there (fig. 2), we believe was due to the fact that most of these customers were on the second delivery. It was not due to a difference in age distribution or to a smaller per capita consumption of milk. The latter was about the same for the two deliveries. The age distribution of the customers is shown in table 2.

TABLE 2.—*Age of Customers*

Age	Total	First Delivery	Second Delivery
Under 5	48	25	23
From 5 to 9	44	23	21
10 to 14	41	22	19
15 to 19	40	26	14
20 and over	255	139	116
	428	235	193

The age distribution of the cases in this outbreak (cases 2-9, inclusive) shows an unusually large proportion of patients over 10 years old, one half as compared with an average of one third in New York State, 1920-1924.

The sex of the ninety-six persons under 20 years of age on G.'s first delivery was forty-three males, fifty females and three unstated, making no allowances for milk consumed at restaurant W. Of the eight presumably milk-borne cases (cases 2-9, inclusive) six of the patients were male, giving a proportion of 3:1 as compared with 1.31:1.0 for New York State, 1920-1924.

Another peculiarity was the poor living conditions of four of the families in which cases occurred, while with a fifth it was a mere matter of opinion whether it should be so classed or not. It was at first thought that this might be due to G.'s having this class of trade; but the census of his customers taken by the nurses listed only nine of ninety-eight families as living under poor conditions. It will have been noted that there was but one case in a family and that in only one family was there a suspicion of more than one case (case 7).

In thirty-seven milk-borne typhoid outbreaks in New York State for which sufficient data are available to make the computation, it is found that the average has been one case to about every 14 quarts of milk sold daily by the implicated dealer. The median is about half that figure. However, there are five instances in which the proportions were much lower, showing only one case to 38, 44, 45, 71 and 86 quarts daily, respectively. The figure for this outbreak is about one case to 30 quarts, counting case 9; one to 35 quarts if case 9 is excluded. However, if this computation is made on the first delivery only of dealer G.'s milk, the ratio would about equal the average noted above for typhoid.

The fact that one boy contracted the disease, though he drank only two glasses of the milk, is an occurrence that is not uncommon in typhoid outbreaks either from milk or from water, and is usually interpreted as a function of susceptibility. The fact that all of the other cases occurred in families receiving night's milk led to the suspicion that this outbreak was due to a single contamination of milk at the dairy farm, and to the inference that the milk used at the party attended by this patient was of that lot. We endeavored to determine just which milking this came from; but, in view of the fact that this milk was not delivered on the route, this could not be determined. From a careful survey of the handling of milk by dealer G., it appears that this milk could not have been earlier than the night of December 10, nor later than the morning of December 12.

SUMMARY

As to the Cortland outbreak, we would point out that the only cases to occur in a city of 15,000 people subsequent to the appearance of three cases more than two months previously were, with one possible exception, in persons who drank milk from one dealer who sold less than 4 per cent of the city's total supply; that the cases were distributed widely enough to make it improbable for the milk supply to be a mere coincidence of geographic distribution. When to these facts we add that an actual paralytic case of the disease existed on the dairy farm from which most of the milk came; that this patient was milking the cows and handling the milk for a period of four days while in the acute stage of the disease, and as the time which elapsed between this period and the dates of the onsets of the subsequent cases was consistent with the generally accepted minimum and maximum incubation periods of poliomyelitis, the chain of circumstances is as complete as is found in the majority of milk-borne outbreaks of other diseases. While this outbreak points to transmission through milk,[1] we are not of the opinion that this is the usual mode of spread of poliomyelitis.

NOTE.—Since this report was written, two additional cases in this outbreak have come to light, one a playmate of patient 8. This child lived in a connecting house and visited patient 8 when he was first taken sick. The other was an adult living in the seventh or eighth house supplied by dealer G, on his second delivery.

1. Dingman, J. C.: Report of a Possibly Milk Borne Epidemic of Infantile Paralysis, New York State J. Med. **16**: 589 (Dec.) 1916.

General Hospitals for Whole Community.—To use the general hospitals, either in themselves or with annexes, for the admission of all classes of the community would touch in many points the duties and interests of the profession, both those members of it already engaged in the treatment of the inmates of these institutions, and the unattached general practitioner. If the conditions attending the admission of paying patients into a general or private hospital be regarded as similar to those subsisting in the present private nursing homes—and doubtlessly they would be so—there can be no difficulty in the matter of professional attendance, for every doctor would treat his own patient, and the official staffs of the hospitals would in no way be called on except when sought for in consultation by the patient's own doctor; and it would be no little source of satisfaction and convenience both to the doctor and patient that an expert opinion on any matter could be readily obtained when desired. A further gain to the family doctor would exist in the perfect equipment of the institution, whereby he could either himself, or with the aid of an expert, obtain all those necessary laboratory examinations.—Maylard, A. E.: *Glasgow M. J.* (June) 1926.

HYPERREFLEXIA OF LOWER LIMBS AFTER EXERCISE *

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A distinction must be made between the effect produced by prolonged exercise and that occurring after moderate use of muscles during only a few minutes. Much attention has been paid to the results of muscular exhaustion, but little to the change in reflex activity resulting in rare cases from taking a few steps through a room, especially when intermittent lameness of vascular origin, either central or peripheral, is not under consideration.

Knapp and Thomas studied the reflexes in long distance runners, young men who ran over a course of twenty-four miles. They remark that the influence of fatigue on the reflexes has been disputed. Lombard found that moderate fatigue caused a decided diminution in the knee jerk, and he explained the discrepancy between his conclusions and Sternberg's by the fact that Sternberg's observations were made in cases of extreme fatigue. Other writers, they state, have in the main agreed with Sternberg's conclusions that the reflexes are exaggerated by fatigue, provided it is moderate; while excessive fatigue diminishes or abolishes the reflexes. Knapp and Thomas[1] found that the run in many of the twenty-six cases that they examined caused some diminution of the knee jerk. In only four cases was there an increase. In no case was there a clonus. The diminution was often decided. In three cases the reflex was absolutely lost. The ankle reflexes also showed a diminution. The loss of the ankle reflexes did not always coincide with the loss of the knee jerks. These studies were made on men greatly exhausted.

During the recent war I had the opportunity of studying the effect of forced marches on certain young men who had been taken from sedentary occupations and forced to carry heavy equipment on long hikes. The following case is an example of what probably was of rare occurrence:

H. P., a man, aged 29, in good health, volunteered for the army and entered the service in June, 1917. While at Camp Green, N. C., in October, he awoke one morning and found both lower limbs powerless. For some weeks previously these limbs had felt numb and weak after any long hike. He could not move his lower limbs below the hips for about ten days following the sudden onset of paralysis; then his right lower limb began to recover motor power, and at the end of two weeks this limb seemed to be about normal. Sensation at first was impaired for touch and pain below the knees. He had no incontinence of bladder or bowels. In about three weeks from the onset of the paralysis he was able to walk with a cane, and two or three weeks after this was discharged from the hospital, and returned to duty. He must have been in good condition, but he stated that after long hikes he continued to get a numb feeling in the left lower limb.

He was sent to France early in the spring of 1918, and returned to this country in July, 1919. While in France he spent seven months in the front lines. He was in six battles and went over the top repeatedly. He complained of some discomfort in his left lower limb during his entire stay in France. He was discharged from the army without disability in July, 1919.

The interesting features in this case are that the man had had no symptoms in the lower limbs until he began

* Read before the Philadelphia Neurological Society, May 28, 1926.

1. Knapp and Thomas: The Reflexes in Long Distance Runners: A Study of the Influence of Fatigue on Certain Reflexes, J. Nerv. & Ment. Dis. **31**: 94 (Feb.) 1904.

to take long hikes, from 8 to 12 miles a day, without previous training, and had carried an equipment which was said to weigh between 50 and 60 pounds. Before entering the army he had been a butcher. It seemed to me that he probably had some predisposition to functional disorder in the lower limbs, and that the severe exercise of these limbs caused vascular disturbance and produced an intermittent claudication of the spinal cord.

When he was examined by me, May 16, 1921, his patellar reflexes were markedly exaggerated, he had bilateral patellar clonus, persistent ankle clonus on the left side, and probably bilateral Babinski sign. His sensations of vibration, position, pain and touch were normal everywhere, his left lower limb was slightly weaker than the right, and the right was normal in motor power. Lumbar puncture and roentgen-ray examination of the spine revealed nothing abnormal.

It seemed evident that organic change had occurred in the spinal cord probably in relation to excessive exercise.

My attention has been arrested recently by increased reflex activity after slight exercise of muscles when there could be no possibility of exhaustion. This phenomenon is of very rare occurrence and would seem to indicate that some abnormal condition of the central motor tracts must exist when it is observed. It seems to me that it may be an early sign of degeneration of the pyramidal tracts. The case in which I made the observation of hyperreflexia after slight exercise is as follows:

A man, aged 51, referred to me by Dr. S. S. Landis of Harrisburg, Pa., Jan. 6, 1926, complained of pain in the right hip. Fifteen years previously he was struck in this hip by a piece of steel rail. He was not at all disabled by this accident and had no pain from it at the time. Two years later he first experienced a shooting pain at the right sacro-iliac articulation; at first it was felt only two or three times a year, but it had increased recently until it occurred every three or four weeks and lasted about a week. It is now a steady pain with exacerbations, and radiates down the back of the right lower limb to the inner side of the sole of the foot. For a number of years the man was obliged to lean forward during the attacks while walking, because it was painful for him to straighten up. A roentgenogram of the lumbar spine by Dr. Pancoast was negative. I regarded the condition as sciatica, and Dr. Moxey diagnosed probably subsiding sacro-iliac weakness. This pain probably has little or no relation to the results of his further examination. It is important, however, that he had observed that his lower limbs tired easily, but he had no definite paralysis in these limbs.

I saw him first in my office. He had walked several squares, and the tendon reflexes of the lower limbs were greatly exaggerated. I sent him to the University Hospital, where he was put to bed and a careful examination was made by my intern, Dr. Miller. On reading the notes the next morning, I found the statement that the biceps and triceps reflexes were normal; that the patellar reflex was exaggerated on the right side but normal on the left; that the Achilles reflexes were both normal; that there was no ankle clonus and no patellar clonus, and that the Babinski reflex was with flexion. These findings in the reflexes were so dissimilar to what I had obtained in my examination the day before that I felt some mistake must have been made. I found, however, that a little exercise of the lower limbs caused a great increase in the reflex activity of these limbs. Mornings, after a night's rest, the patellar reflexes were about normal, and moderate ankle clonus could be obtained on the right side but not on the left. The Achilles reflex on the left side was a trifle exaggerated. The Babinski reflex was always with flexion even after walking.

Bilateral ankle clonus became very pronounced after the man had walked up and down the room two or three times, especially after he had climbed stairs, and the patellar reflexes also were greatly increased. The lower limbs were not spastic and in no way paretic.

The blood Wassermann reaction was negative. The lumbar puncture gave negative findings. The Wassermann and colloidal gold tests of the spinal fluid were negative.

I regarded the case as one of possible incipient spastic paralysis, and the absence of signs of organic disease of the central nervous system is in contrast to a somewhat similar case as regards the reflexes reported by Rouquier and Couretas.[2]

These observers reported before the Neurologic Society of Paris, Dec. 3, 1925, a case of cervical syringomyelia in which inconstant signs of pyramidal tract irritation were produced in the lower limbs by fatigue. They spoke of chronic disease of the central nervous system, with slow development in which signs of pyramidal tract disease were absent in repose but appeared after muscular exertion. Their patient had syringomyelia of the scapulohumeral type. When he was lying down the patellar reflexes were lively, the Achilles reflexes were normal, and there was neither patellar nor ankle clonus. Exercise of the lower limbs, as going upstairs, altered the clinical picture immediately. Ankle clonus became persistent on the left side and less pronounced on the right. Patellar clonus was persistent on the left side and abortive on the right. The Babinski reflex had been in flexion before the muscular effort, but after muscular effort became typically in extension on the left side. It was inconstant on the right. These signs of pyramidal tract irritation disappeared after a few hours' rest. The gait was normal.

Rouquier and Couretas say in a very general way that similar observations have doubtless been made by neurologists in other disease than syringomyelia, but they do not give reference to a single case.

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PREPARATION OF A POTENT VASODILATIN-FREE PANCREATIC SECRETIN *

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In a preliminary note, Luckhardt, Barlow and Weaver [1] described a simple and at the same time efficient method of preparing a highly active solution of pancreatic secretin by placing in an excised duodenojejunal loop of intestine, after the intestinal contents have been washed out, from 0.2 to 0.4 per cent of hydrochloric acid, and allowing the latter to remain in the intestine from ten to thirty minutes. The acid thus removed is usually clear or straw colored, contains no heat coagulable proteins, and can be injected intravenously. Under one well known condition, to be mentioned presently, such solutions of secretin may cause only a slight fleeting vasodilatin action, coupled with a marked secretory response of the pancreas.

These facts suggested that such a solution of secretin, because of its sometimes negligible action on blood

2. Rouquier and Couretas: Signes inconstants d'irritation pyramidale, au niveau des membres inférieurs, provoquées par la fatigue, chez un sujet atteint de syringomyelie cervicale; atrophie musculaire, à debut scapulo-huméral; hyperréflectivité avec inversion des réflexes stylo-radial et du biceps, Rev. neurol. **2**: 769 (Dec.) 1925.

* From the Hull Laboratories of Physiology and Physiological Chemistry, University of Chicago.

1. Luckhardt, A. B.; Barlow, O. W., and Weaver, M. M.: Am. J. Physiol. **76**: 182, 1926.

pressure and absence of physiologically inert or perhaps deleterious products elaborated by the usual process of preparation of secretin, might form the starting point of an investigation designed not only to rid the solution of the last vestiges of vasodilatins but also to prepare the pure product (pancreatic secretin).

LITERATURE

The authors mentioned were led to the development of this simple method (on the intestines of dogs used in the laboratory for other purposes) as a result of a previous observation of Grogan and Luckhardt,[2] previously made by Matsuo,[3] and again later and independently by Ivy,[4] that the acid washings of the upper portion of the small intestine collected from a living dog possess marked secretagogue action on the pancreas when intravenously injected. This secretagogue action is often accompanied by very little vasodilatation. On the other hand, if one introduces 0.4 per cent hydrochloric acid repeatedly into the intestine of a living animal, the intestine exposed to the acid becomes in time cyanotic and then hemorrhagic. The mucous membrane furthermore loses its distinctive firm appearance and consistency and is reduced to a slimy gelatinous membrane, which can be removed from the underlying muscular coat with the greatest ease. At any rate, whether living or dead, a quick and simple extraction of the mucous membrane at room temperature favors the preparation of a very active secretin solution, and the method involves no severe treatment or maceration of the mucosa. The extract, furthermore, may contain an almost negligible amount of vasodilatin, a fact of great importance in any discussion on the mechanism of action of so-called pancreatic secretin solutions (Bayliss and Starling).

Popielski,[5] in a great number of papers, questioned the physiologic significance of the discovery of Bayliss and Starling that acid extracts of the duodenal upper intestinal mucosa possessed secretagogue properties (pancreatic secretin). He emphasized the fact that such extracts possess more or less powerful vasodilation, as evidenced by a great fall in blood pressure. The latter effect he considered the direct cause of the secretion. Luckhardt, Henn and Palmer[6] also questioned the physiologic significance of Bayliss and Starling's findings by reporting that pancreatic secretin could be prepared from the mucous membrane of either the stomach or the intestine, and that gastrin, whatever its source, stimulated the stomach and pancreas to activity. Popielski's position, however, was rendered quite untenable as the result of the investigations of Carlson, Lebensohn and Pearlman,[7] Luckhardt and Blonder,[8] and Parsons.[9] Carlson and his associates showed that secretagogue action of a pancreatic secretin solution is destroyed by a brief period of digestion with pepsin-hydrochloric acid or gastric juice. Luckhardt and Blonder confirmed this result and showed, furthermore, that either mild alkaline treatment or tryptic digestion seriously interfered with the secretagogue effect of such solutions without having the slightest effect on its vasodilating properties. Eloise Parsons,[9] in chemically analyzing secretin preparations for histamine content, not only proved that histamine is not the vasodilator constituent of the Bayliss and Starling crude secretin but that, although the treatment involved in the chemical analysis destroys the secretin action of the preparation, it has little or no effect on its depressor constituent. In other words, vasodilatation is as pronounced after treatment with the various agents mentioned as it was before, and still secretion no longer follows such a generalized vasodilatation.

Other evidence was adduced by Luckhardt and Blonder[8] pointing to the possibility that a given pancreatic secretin solution contained two distinct substances whose physiologic action were simultaneously expressed when injected. Among other reasons, there is no direct relation in a given animal between the extent of the vasodilatin and the secretory response. Luckhardt, Weaver and Barlow[10] tested out the pancreatic secretory activity in a given animal of the most powerful vasodilatin known, acetyl choline.[11] In only the most sensitive preparations did this substance in any dose produce more than a few drops of pancreatic juice, whereas a pancreatic secretin solution effecting even a less decided fall in blood pressure caused a copious secretion which, unlike the secretion from acetyl choline, could not be abolished by the injection of a suitable dose of atropine.

GENERAL METHODS

METHOD OF PREPARING DOGS FOR INJECTION

Rather large dogs were used (from 15 to 25 Kg.). These were starved from one to three days. They were then placed under light barbital anesthesia, barbital sodium being used in doses of from 225 to 250 mg. per kilogram, injected intravenously. Within fifteen to twenty minutes the animal was usually anesthetized.

The carotid artery was cannulated in the usual way for a blood pressure record. The saphenous vein was prepared for the purpose of intravenous injection. The duct of Santorini was then cannulated, no attempt being made to cannulate or ligate the duct of Wirsung. The end of the cannula in the pancreatic duct was brought outside the body and the abdominal wall sutured around it. At this point the dog was ready for injections.

METHOD OF PREPARING "NEW SECRETIN"

We are accustomed to call secretin preparations made in the following manner "new secretin," in contradistinction to "old secretin" as prepared by the method of Bayliss and Starling.

In a previous communication,[1] the essentials of this process were reported. In the routine preparation we have been accustomed to proceed as follows:

The intestine is removed from the dog or dogs as soon after death as possible—in some cases even before the animal's heart has stopped beating. The first 100 to 150 cm. of intestine is then excised, the pylorus of the stomach being included when practicable, and this length of intestine is washed by the passage through it of a fairly rapid stream of cold tap water. This serves to remove débris, worms, etc., which are commonly found even in the upper bowel. If this process is accomplished immediately after the death of the animal, there is practically no evidence of desquamated epithelial cells in the washings.

A hemostat is then placed at one end of the strip of intestine and 100 cc. of 0.4 per cent hydrochloric acid introduced through the other end and the end closed by a second hemostat. Four-tenths per cent acid is used as a routine because it seemed to give a more powerful preparation than extraction with 0.2 per cent acid.

After the acid has been enclosed in the intestine, the latter is simply allowed to lie on the top of a laboratory table for thirty minutes. This length of time is purely arbitrary, and

2. Grogan, R., and Luckhardt, A. B.: Am. J. Physiol. **68**: 142, 1924.
3. Matsuo, I.: J. Physiol. **45**: 447, 1912-1913.
4. Ivy, A. C.: Personal communication to the authors.
5. Popielski, L.: Ztschr. f. Physiol. **19**: 801, 1906; Arch. f. d. ges. Physiol. (Pflüger's) **121**: 239, and subsequently.
6. Luckhardt, A. B.; Henn, S. C., and Palmer, W. L.: Am. J. Physiol. **59**: 457, 1922.
7. Carlson, A. J.; Lebensohn, J. E., and Pearlman, S. J.: Has Secretin a Therapeutic Value? J. A. M. A. **66**: 178 (Jan. 15) 1916.
8. Luckhardt, A. B., and Blonder, E.: Am. J. Physiol. **68**: 142, 1924.
9. Parsons, Eloise; and Koch, F. C.: Proc. Am. Soc. Biol. Chemists **18**: 38, 1923. Parsons, Eloise: Am. J. Physiol. **71**: 479 (Feb.) 1925.
10. Luckhardt, A. B.; Weaver, M. M., and Barlow, O. W.: Unpublished data, 1926.
11. Hunt, R.: Am. J. Physiol. **45**: 197, 1917.

we have found that ten minutes may serve as well in many cases. After the loop has stood for thirty minutes, one hemostat is removed and the acid allowed to filter through cotton or filter paper into a flask. The intestine is not stripped to get out the last drop of solution, because such a procedure massages out cellular débris, which tends to render the filtrate turbid.

As prepared in this manner, there is very commonly a tinge of bile in the solution. On the other hand, the solution may be practically water clear.

METHOD OF PREPARING "OLD SECRETIN"

We have followed in general the method of Bayliss and Starling,[12] namely, that of scraping off the mucosa and weighing. At this point our procedure varies somewhat from the original in that we do not grind up the mucosa, although we chop it up to a greater or less extent with scissors. We believe this procedure to be a distinct advantage over the old because, while the mucosa may not be so thoroughly extracted, nor is so much of the secretin content obtained, nevertheless the final preparation contains far less protein, mucus and other extraneous material when boiled later for four minutes with 0.4 per cent hydrochloric acid.

After boiling, we filtered through cotton or filter paper, without neutralization. A preparation made as described compares favorably in secretagogue activity with one in which the mucous membrane is ground and thoroughly rubbed up with sand before boiling with 0.4 per cent hydrochloric acid. From 4 to 5 cc. of 0.4 per cent hydrochloric acid was used for each gram of mucosa.

In general we have adopted a dosage of 5 cc. of both "new secretin" and "old secretin" for a single injection into the animal, but in some of the largest dogs (over 20 Kg.) we have increased this dosage to between 7 and 10 cc.

12. Bayliss and Starling: J. Physiol. **28-29**: 325, 1902.

METHOD OF PRESERVING SECRETIN PREPARATIONS

In our early experiments we made an attempt to preserve solutions by adding a layer of toluene, keeping in dark bottles and conserving in the ice chest. Such attempts met with only partial success. If the preparations are to be tested out within a day or so it is probably best to leave them as they are, certainly without toluene, for this substance is not an efficient preservative, and unless it is boiled off prior to injection of the secretin solution, can certainly do no particular good. Some of the preparations were boiled, and this procedure seemed to prolong their activity, although it did seem at times to increase the vasodilatin effect of the "new secretin" preparations.

RESULTS

As we offered no figures or tables in our preliminary publication,[1] we reproduce at this time three graphic records illustrating the characteristic effects of two preparations of "new secretin" and, for comparison, one prepared in the usual way by the method of Bayliss and Starling ("old secretin").

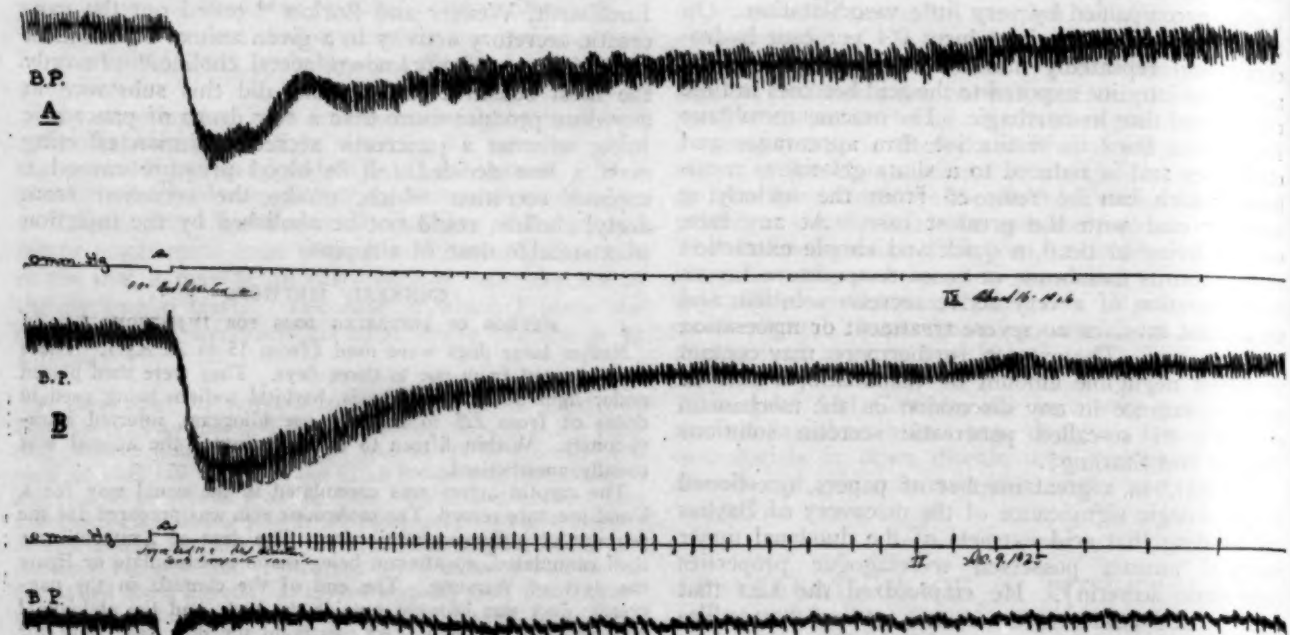

Fig 1.—Blood pressure tracings, showing pancreatic response in drops of secretion recorded by a signal magnet on base line. Base line at 0 mm. of mercury pressure. Intravenous injection of secretin preparations at *a*. *A*, maximum vasodilatin effect of a secretin preparation injected at *a*, made by extracting with 0.4 per cent hydrochloric acid in mortuo, as described in the text. *B*, typical vasodilatin and secretory response following the injection at *a* of secretin preparation made by the method of Bayliss and Starling. *C*, slight and fleeting vasodilatin effect followed by copious secretion of pancreatic juice after the injection at *a* of a secretin preparation made by extraction in mortuo, as described in the text. This tracing is an example of the most powerful secretory response with the minimum of vasomotor effect which this method of extraction yields.

Figure 1 *A* represents the poorest type of preparation of "new secretin," as evidenced by a moderately severe drop in blood pressure of a protracted character. In Figure 1 *B*, we illustrate the usual hemodynamic effect and secretory response following the intravenous injection of "old secretin" (Bayliss and Starling). Figure 1 *C*, on the other hand, represents the best response obtained when the preparation is made by the simple method described above. The slight hemodynamic effect is so fleeting and the secretagogue action is so profound that it would be academic quibbling, even without the other evidence presented earlier in this paper, to propose that this response was due to the

initial and evanescent depression in blood pressure. We call attention to the fact that the injections were made with the blood pressure at a high level.[8]

It was this or a similar type of preparation which seemed to us highly favorable for further purification for the isolation of an entirely vasodilatin free solution. Many of the methods designed to effect this separation were entirely negative and will merely be mentioned.

For example, in an attempt to effect a separation by dialysis of "new secretin" solution through collodion tubes of different thicknesses, it was found that the vasodilatins passed through with the secretin. Ultrafiltration was equally unsuccessful. Vacuum dialysis by means of fish skin condoms, as described by Hanke,[13] led to destruction or disappearance of both substances. The observations by Parsons [14] suggested the possibility of adsorption of secretin on a solid phase in that she demonstrated the adsorption of secretin on infusorial earth and later released it by hydrochloric acid treatment. Our selective adsorption on fullers' earth and particularly on permutit also yielded some suggestive results. In this attempt we shook from 1 to 2 Gm. of permutit with 0.4 per cent hydrochloric acid until the suspension remained definitely acid to litmus. The permutit was then collected on filter paper and subsequently resuspended in from 10 to 15 cc. of "new secretin." After shaking at room temperature for ten

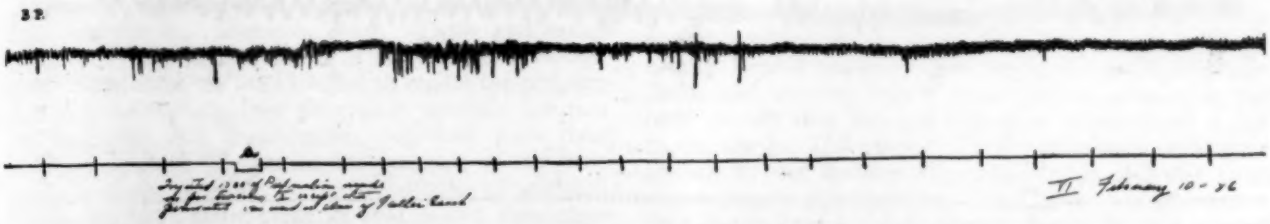

Fig. 2.—Blood pressure tracing and secretory response of the pancreas as described in figure 1. Tracing shows pancreatic response before and after the injection at *a* of 12 cc. of a secretin preparation made by extraction in mortuo. The vasodilatin has been removed by treatment with permutit, as described in the text. The results express a temporary doubling of the secretion rate without vasodilatin effect and suggest the possibility under proper conditions of separation by this method.

or fifteen minutes, this suspension was filtered. The filtrate proved physiologically inactive. The permutit with the adsorbed vasodilatin and secretin was next treated with a 5 to 10 per cent sodium chloride solution. This filtrate, when injected, gave on one occasion the suggestive result given in fig. 2.

As will be seen, the secretion rate is doubled in the absence of any vasodilatin effect. The precise conditions under which such a separation can be effected are unknown to us. We have been unable to duplicate these results, though on a few occasions we have seen a slight increase in the spontaneous secretion rate without a detectable effect of such a preparation on the general blood pressure.

Although the precipitation of secretin by mercuric chloride has been unsuccessfully applied by others, we thought it worth while to attempt it again, in the hope that by following the process used by Abel [15] in extracting the mercury sulphide precipitate obtained in the pituitary hormone studies, by saturated sodium chloride, we might recover some part of the completely lost secretin activity. The results were, however, again negative. In fact, the saturated sodium chloride extract, when injected intravenously, caused a slight rise in blood pressure, as was to be expected. These negative results and this rise in blood pressure suggested that certain control experiments should be conducted on a known secretin solution in order to determine whether the relatively mild chemical treatment by hydrogen sulphide, carbon dioxide or sodium chloride saturation would destroy secretin or inhibit its action. In short, every treatment involved in the mercuric chloride precipitation and the subsequent decomposition of the precipitate was applied with the exception of adding the mercuric chloride. These studies showed no destructive effect by hydrogen sulphide or carbon dioxide treatment. On saturating a solution of "new secretin" with sodium chloride, however, a precipitate was obtained which, when properly washed, was found to be a very active secretagogue and entirely free from vasodilatin in the doses employed.

METHOD OF PRECIPITATING AND RESOLUTION OF A RELATIVELY PURE PANCREATIC SECRETIN

The process consists essentially in saturating, or nearly saturating, a crude "new secretin" solution with crystalline sodium chloride. One calculates approximately the amount of sodium chloride necessary to saturate the given quantity of solution, and then adds a somewhat smaller quantity of crystalline sodium chloride.

While there is evidence that concentrations of substantially less than half saturation with sodium chloride are sufficient to precipitate the secretin, it has been found advisable to use the higher concentration, as the precipitate is more flocculent and may be filtered more readily. The precipitate so formed floats on the surface of the solution and can readily be decanted or filtered.

At this point it is necessary to free the precipitate of all traces of the original filtrate which contains the vasodilatin fraction. This is necessary because the vasodilatin acts, apparently, in minute amounts, and if the precipitate is not carefully washed there is carried over an appreciable quantity of vasodilatin in further extractions. It has been found advisable, therefore, to wash the precipitate several times with 0.4 per cent hydrochloric acid saturated with sodium chloride. In the case of secretin precipitate made from "new secretin" solutions, this method of washing seems to be sufficient to free the precipitate from vasodilatins, at least so far as is grossly detectable by intravenous injection into a dog.

When the preparation used as a starting point has been made by the method of Bayliss and Starling ("old secretin"), such treatment does not suffice. In such cases various difficulties are encountered. The precipitate does not collect so readily. When, by means of vigorous centrifugalizing the precipitate is collected, it is a sticky mass, containing appreciable quantities of fat. Accordingly, it has been found necessary to dry the precipitate at this point and carefully extract it

13. Hanke, M. I., and Koessler, K. K.: J. Biol. Chem. **60**: 495, 1925.
14. Footnote 9, second reference.
15. Abel, J. J.; Rouiller, C. A., and Geiling, E. M. K.: J. Pharmacol. & Exper. Therap. **22**: 289 (Nov.) 1923.

with ether. The precipitate is then redissolved in 0.4 per cent hydrochloric acid and reprecipitated with sodium chloride, and this process is repeated several times. By this method it has been found possible to get rid of most of the vasodilatins from secretin prepared after the method of Bayliss and Starling. But even then it may not be possible to free the preparation of the vasodilatin.

The sodium chloride precipitate (pancreatic secretin), washed free from the last vestiges of the filtrate containing the vasodilatin, can now be dissolved in a suitable amount of distilled water. It forms a perfectly clear to slightly turbid solution, entirely devoid of vasodilatin effects, as will be seen from an examination of figure 3. This tracing shows the secretory and hemodynamic effects of two preparations of "new secretin" before (*A* and *C*) and after (*B* and *D*) the separation of the secretin from the vasodilatin tested out on the same dog at a time interval of fifteen minutes between successive injections.

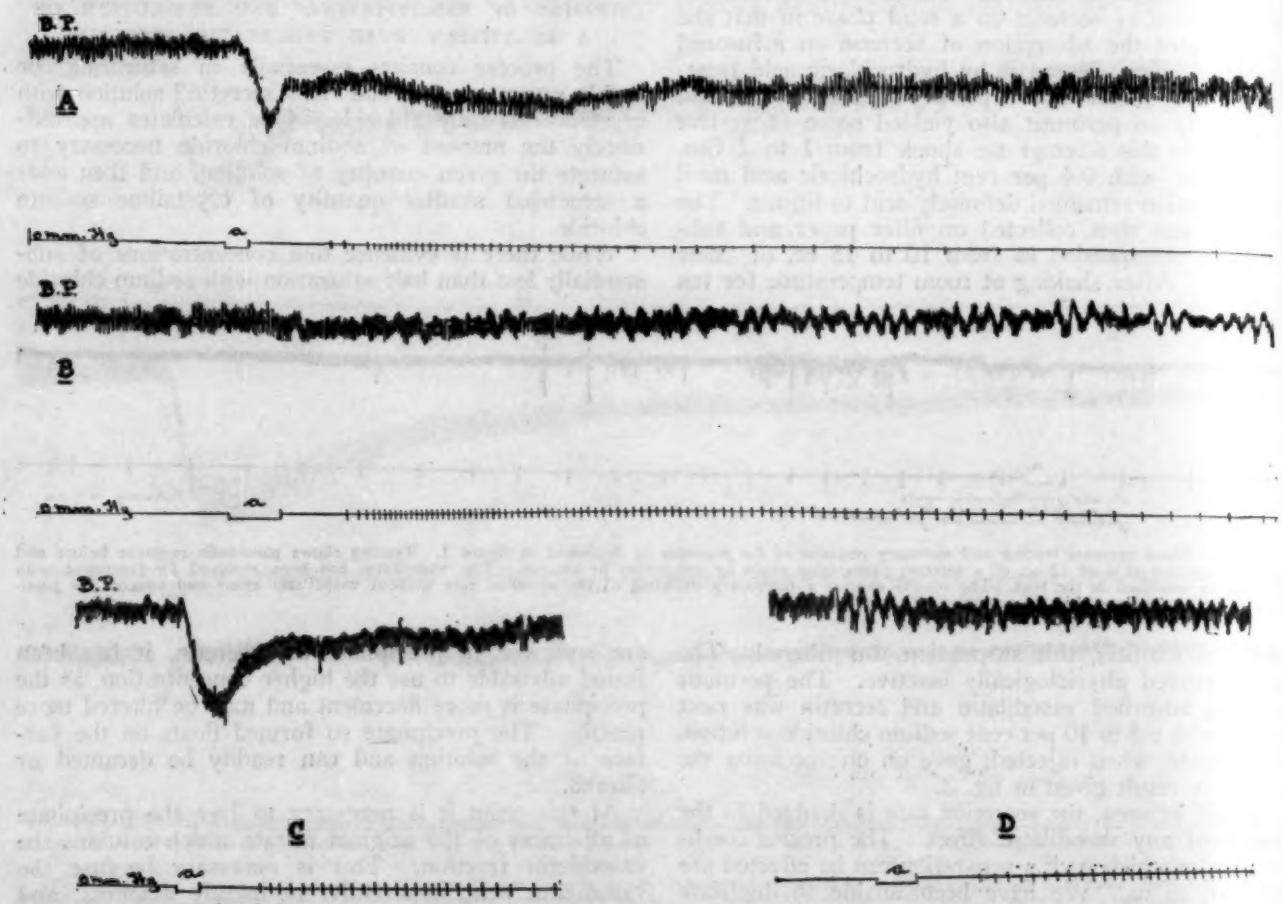

Fig. 3.—Secretory and hemodynamic effects following the intravenous injection of "new secretin" solution before (*A* and *C*) and after (*B* and *D*) the separation of the secretin from the vasodilatin by a method described in the text.

In *B*, twice the secretory dose was injected in order to test out the efficacy of the separation. Whereas the secretory response is doubled to a drop, there is no apparent vasodilatation. The profound respiratory depression was likewise greatly diminished, to say the least.

A "new secretin" preparation which was not powerfully active was treated in the usual way with sodium chloride. The precipitate was dried on a glass plate over a radiator. The dried powdered material failed to go into solution, and still the filtrate, clear as distilled water, possessed a most powerful secretory effect without having the slightest effect on the general blood pressure. This experiment, if it can be repeated, would seem to indicate that most of the precipitate consists of physiologically inert material. It further indicates that, in the process of drying, the proteins were rendered more or less insoluble but still permitted some of the active secretagogue to be washed from them.

Quite recently, Volborth [16] maintained that a vasodilatin free secretin preparation can be prepared by acidifying the sediment in succus entericus collected from a Thiry fistula.

Stepp [17] outlined a method which, applied to our so-called new secretin solution, promises a vasodilatin-free preparation.

COMMENT

The most promising result from this endeavor to separate the active hormone from the vasodilatin and the final isolation of pancreatic secretin in its pure form lies in the precipitation of the principle (with protein) by means of sodium chloride. Resolution of this precipitate after washing it with acidulated water yields a clear solution with marked secretory activity and possessing no dilatin action. It is a significant fact that in the precipitation designed to separate the vasodilatin from the secretin, so-called new secretin offers by far a better preparation than does old secretin. If old secretin is used, the precipitate always contains a greater amount of vasodilatin, which cannot be got rid

16. Volborth, G. W.: Am. J. Physiol. 72: 331 (Oct.) 1925.
17. Stepp, W.: J. Physiol. 43: 441, 1912.

of even by repeated reprecipitation and washing. Either the boiling of "old secretin" introduces another dilatin or in some way modifies the nature of the old secretin preparation so that an easy separation is no longer possible. It must be remembered, furthermore, that under most conditions of preparation of secretin by our technic there is less vasodilatin in the preparation necessary for removal. In this connection we also take occasion to point out that those preparations of new secretin contain the least amount of vasodilatin which are prepared at the earliest possible moment after the somatic death of the animal. If the intestines are allowed to stand about before the preparations are made, the acid contents are less clear, there is plainly a turbidity due to postmortem desquamation of the intestinal mucosa, and the vasodilatin content is increased. The ideal preparation for purification would be such as is obtained from an animal in vivo. Since this is not always practicable, the material had best be worked up immediately after death.

At any rate, this new and important step in the purification of the principle opens up many problems which at present are of physiologic (and theoretical) interest only (pharmacology of this highly purified substance, the possible separation of gastrin by the same method, the question of identity of the pure secretin and gastrin, the effect of forced subcutaneous and intravenous injections on intestinal digestion and the islet tissue of the pancreas, etc.). These and others will receive due consideration in subsequent investigations. At present we are satisfied to report the preparation of a vasodilatin-free pancreatic secretin solution. We feel that this contribution, together with those preceding it, definitely settles the question of the independence of the secretion on the vasodilatin (Popielski). In fact, we have some evidence that rather than cause or even favor the secretion, the vasodilatin action of the usual secretin solution is indeed a hindrance to it.

CONCLUSIONS

1. An easy method of preparing a highly active pancreatic secretin solution ("new secretin") has been developed.

2. Under proper conditions of preparation, such a solution may contain only a minute amount of vasodilatin.

3. The pancreatic secretin from this new secretin solution can be precipitated (with extraneous material) by means of sodium chloride, the vasodilatin fraction remaining essentially in the filtrate.

4. Resolution in water and reprecipitation with sodium chloride lead to a further purification. Under certain conditions the active hormone can be washed from the precipitate, with the result that the hormone is free from vasodilatins.

5. "Old secretin," prepared by the method of Bayliss and Starling, is not so susceptible to separation of the vasodilatin from the secretin by sodium chloride.

6. The preparations of "new secretin" which yield the smallest amount of vasodilatin are those which are made in vivo. Those made in mortuo are best prepared immediately on death of the animal.

7. A second method of selective adsorption to acidified permutit is uncertain and incomparably inferior in our hands with the precipitation by means of sodium chloride.

8. "New secretin" preparations made in vivo or in mortuo remain active for months (even without a preservative), particularly if they are boiled (to destroy most bacteria and enzymes).

9. The sodium chloride precipitate offers an excellent starting point for the ultimate isolation of the active principle in pure form.

THE SANITARY OFFICER AND COUNTY HEALTH WORK*

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NASHVILLE, TENN.

Public health work, whether dealing with environmental sanitation or personal hygiene, is essentially concerned with personal service and must therefore find the solution of its problems in personal and community relationships.

Rural health work has two basic differences from urban health work. Personal relationships in rural health work are more intimate, the health worker being subjected to much closer scrutiny than is the case with urban workers. The second difference is concerned with finance. In the first place, the assessed valuation of rural areas is lower than is the case with cities, and, in addition, appropriating bodies of rural governments have not yet begun the appropriation of very large sums per capita for the protection and promotion of the public health. In a study of eighty-eight full-time county health organizations in operation throughout 1925, and serving nearly four million people, it has been shown that the total budgets represented a per capita tax of 32.4 cents.[1] It is not known what proportion of this theoretical per capita tax is borne from direct county appropriations, but it is fair to assume that expenditures from county funds do not exceed three fourths of the total budgets. On this basis, it would seem that in five Southern states, county governments were able or willing at the present time to spend not in excess of 25 cents per capita for public health purposes, and it is entirely probable that this is too generous an estimate.

In the selection of counties for full-time county health departments, we have usually thought of 50 cents per capita as being a suitable expenditure; a budget of $10,000 per annum as the desirable budget for a unit of four persons, and a county of approximately 20,000 persons as a suitable unit for operations. While, certainly, we do not need to fix our objective on a lower plane at present, it would seem that we have yet much to do in developing a willingness to pay for the services of county health departments in the counties with populations of 20,000 or more, since at present that willingness to pay does not go further than half way toward our objective.

If adequate protection of the public health is essentially concerned with personal relationships, obviously some form of full-time health service must be provided for each political unit of government, as the unit of health organization, though this need not mean that all the personnel of a unit of health organization must confine its activity to an individual political unit of government. Faced with the necessity for providing

* Because of lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the author's reprints.

* Read before the Section on Preventive and Industrial Medicine and Public Health at the Seventy-Seventh Annual Session of the American Medical Association, Dallas, Texas, April, 1926.

1. Table prepared by International Health Board, in a study of five Southern states.

this service, and at the same time confronted with the difficulties of financing rural health work, what, then, is the solution for the rural Southern county of less than 20,000?

Since the county health unit is, in itself, composed of certain elements that deal with different parts of the county health program, it would seem that the judgment of those who have begun the development of a full-time local health organization, with one or more of the elements of the county health department, have shown sound judgment, provided they consider this form of organization to be a step in the development of more adequate local organization, whether that development extends over a period of a few years or over a generation. In some areas, considerable advance has been made by use of the public health nurse in the development of a local program, the principal parts of which are concerned with that phase of preventive medicine commonly termed personal hygiene. In some other areas, it has seemed proper to begin with the environmental sanitation phase of the local health program, with the sanitary officer considered as the logical agent. The latter plan has several advantages, adapting it for use in many Southern counties. In the first place, it deals with some of the fundamentals of rural health work, since the sanitary officer may devote most of his activity to the prevention of soil pollution, protection of water supplies, and certain parts of a malaria control program.

A convincing demonstration of the value of full-time local health work should be possible, as a result of his activity in community "house-cleaning," which, in time, would increase the willingness of the local government to pay for a more adequate organization. It is also probable that the sanitary officer may more rapidly stimulate this willingness to pay for health service, and insure the permanence of his own work to a greater degree than would be possible for the public health nurse, for the activity in which he would engage is less apt to encroach on other fields of service, and therefore less likely to result in misunderstanding. His field of service need not, however, be entirely confined to the foregoing activities, for such an officer, if properly trained, can stimulate the control of communicable diseases by securing more intelligent and more thorough application of the measures of quarantine and isolation, and by doing the promotion and organization work for prophylaxis against the diseases for which specific preventive measures are available. He can secure closer cooperation between the local physicians and the state department of health by stimulating use of the state laboratories; by stimulation of more thorough registration of births and deaths, and the betterment of morbidity reporting; and he can do much in the building of sentiment for medical inspection of schools and other elements of a child hygiene program. His field of activity is, therefore, broad, and, while his limitations are definite, in that he can do little in some fields without assistance, either from the state health department or from some medical personnel within the county, it would seem that his advantages outweigh his disadvantages for certain groups of counties.

Whatever the stage of development, adequate supervision, under a well trained personnel, is a prime essential to success, for without such supervision there will be a surer tendency to degeneration of the program into inefficient activity, than will be the case with county health departments. In addition, financial cooperation by the state is necessary, not only as a stimulant to increased local organization, but also as a stabilizing factor and a measure lessening the danger of unwarranted interference by local political considerations.

Perhaps the fact should be emphasized that the whole plan of procedure herein outlined for the development of efficient health organization in a county as a unit of government, or in a group of counties as a unit of population, must be considered as a demonstration in achieving the form of health administration which is to be regarded as the satisfactory and permanent organization.

Memorial Building.

RURAL SANITATION *

PLATT W. COVINGTON, M.D., C.P.H.
SALT LAKE CITY

In discussing rural sanitation it seems appropriate to consider, first, conditions affecting public health in rural districts as compared with urban; second, the unit best suited for rural health administration and, third, the cost of rural health administration.

CONDITIONS AFFECTING PUBLIC HEALTH IN RURAL DISTRICTS AS COMPARED WITH URBAN

The great advancement in preventive medicine during the last quarter of a century has led to the employment of a trained and full-time personnel in the health department of most of our larger cities. Many of these have accomplished notable results in reducing their community's death rate from preventable diseases. The concentration of a large population over a small area, making possible the occurrence of alarming epidemics, has made the necessity of maintaining such departments obvious. The greater financial resources of such communities have kept the cost within reasonable limitations. In rural districts, however, as the result of less apparent need and smaller financial resources, little effort has been made to improve public health conditions. Largely because of this the reduction in the death rates of cities during recent years has been greater than in the country districts. Because of the character and distribution of its population, and other inherent advantages, until recent years the rural death rate has been much less than the urban. And though the rural districts continue to have the natural advantages favoring a low death rate, a study of the trend in the death rate in the two areas during recent years indicates that the cities are the most healthful places in which to live.

In 1900 the death rate from all causes in the registration area, per thousand of population, was 17.6. Twenty years later, in the same area, it was 13.8, a decrease of 21.6 per cent. During the same period in the cities of this area the decrease was 27.5 per cent, while in the rural districts the decrease was only 7.9 per cent. In the comparison, no allowance has been made for the difference in age, sex and racial distribution. However, were the rates standardized, the contrast would be even more striking, as the populations of the cities contain a larger element of emigrants and colored persons, whose death rate is always higher than that of our native American stock, of which our rural population chiefly consists. Thus, it is seen that the

* Read before the Section on Preventive and Industrial Medicine and Public Health at the Seventy-Seventh Annual Session of the American Medical Association, Dallas, Texas, April, 1926.

country districts which heretofore have had a lower death rate than the cities have lost this advantage as the result of the superiority of urban public health administration.

TABLE 1.—*Urban and Rural Mortality in the Registration States of 1900* (Deaths from All Causes)*

	Death Rates per Thousand of Population			Decline	
	1900	1910	1920	Actual	Per Cent
Cities in registration states...	18.9	16.2	13.7	5.2	27.5
Rural part of registration states	15.2	14.7	14.0	1.2	7.9

* States comprising registration area in 1900: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, Indiana, Michigan, New Jersey, New York and the District of Columbia.

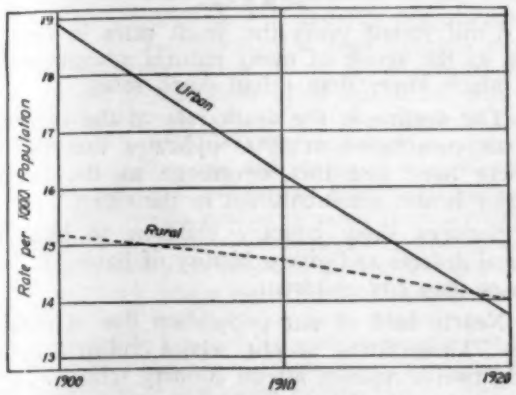

Chart 1.—Decline in urban and rural death rate in registration area as constituted in 1900 (deaths from all causes).

Wood[1] found, after examining more than half a million school children, that a larger percentage of rural school children were physically defective than city children. Likewise, Diehl and Sheppard,[2] after examining the students at a representative state university, found that those who had been raised on farms and in small towns presented a larger number of physical defects than those raised in cities, and that those from rural districts gave a history of having had the most diseases.

Nearly half of our population lives in rural districts, occupying 99 per cent of the total area of our country, representing a class least able to provide public health protection because of financial limitations, and therefore being most deserving of our consideration.

UNIT BEST SUITED FOR RURAL HEALTH ADMINISTRATION

The protection of the public's health is universally recognized as a government function. Its cost, even in rural communities, when paid by not too small a group of population, is rarely excessive. Five sixths of the counties in the United States are entirely rural. About 10 per cent have no incorporated towns, and more than 50 per cent have no towns of more than 2,500 population. To provide public health administration approaching adequacy in this area is a duty of the government, and of all the governmental units, the county, with the aid of the state, is best suited to assume the responsibility. It has the advantage, in most states, of having authority to levy and collect taxes, and, within certain limitations, to appropriate funds for public health purposes. The experience of many states has clearly shown that the county is the ideal unit for health service. The solution of the problem of providing efficient health administration for those living in rural districts lies in the development of efficient full-time county health organizations. When this plan becomes universal rather than exceptional, as is now the case, we may expect that the decline in the rural death rate will equal, if not exceed, that of the cities.

In the Northeast, every city and town of some size has had for a number of years a municipal health department; but in rural sections little has been done until recently. Health departments developed first in the larger cities. The states of North Carolina, Washington and Kentucky were the first to have a county place its rural health work on a full-time basis. Jefferson County, Ky., did so in 1908.

In the early development of rural health organizations, it was thought that the services of a full-time physician were sufficient for the maintenance of a rural health program; but later experience has shown that there is needed, in addition, one or more nonmedical assistants, the number depending on the population and resources of the county.

Dec. 31, 1923, there were 230 counties maintaining full-time rural health organizations. Dec. 31, 1924, there were 279, and Dec. 31, 1925, there were 299 organizations maintained in thirty-three states. The number increases from year to year. Once given a trial, it is very exceptional for full-time county health departments to be discontinued. Usually they are expanded as the need becomes obvious. Of the states having the largest number of county health organizations, Ohio leads the list, with more than half of her counties maintaining a full-time rural health organization, North Carolina and Alabama occupying second and third place.

TABLE 2.—*Number of Full-Time County Health Departments, Dec. 31, 1925*

Alabama	28	Maryland	6	Oregon	5
Arkansas	3	Massachusetts	1	Pennsylvania	2
Arizona	1	Minnesota	1	South Carolina	16
California	7	Mississippi	13	South Dakota	3
Colorado	1	Missouri	10	Tennessee	11
Georgia	21	Montana	3	Texas	5
Illinois	4	New Mexico	8	Utah	2
Iowa	1	New York	1	Virginia	15
Kansas	9	North Carolina	35	Washington	4
Kentucky	8	Ohio	47	West Virginia	8
Louisiana	11	Oklahoma	8	Wyoming	1

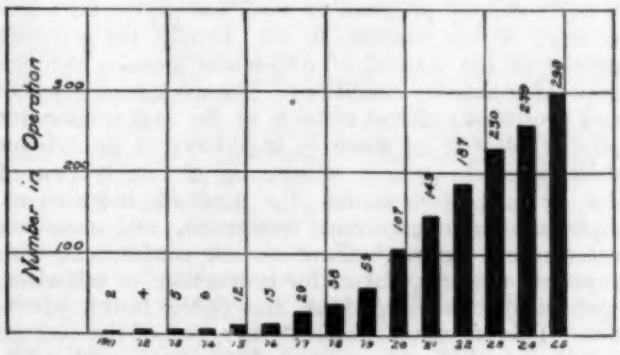

Chart 2.—Development of full-time county health departments in the United States.

1. Wood, T. D.: Health Essentials for Rural School Children, ed. 2, Chicago, American Medical Association, 1921.
2. Diehl, H. S., and Sheppard, W. P.: Rural and Urban Health, J. A. M. A. **83**: 1117 (Oct. 11) 1924; J. Indust. Hyg. **7**: 481 (Nov.) 1925.

COST OF RURAL HEALTH ADMINISTRATION

The personnel necessary to make progress in the prevention of sickness will depend largely on the population and area of the county. The annual budget for a full-time county health department varies from $6,500 or $7,000 in a few counties having a small population to a much larger amount, Los Angeles County, Calif., having the largest budget. In the typically rural counties, with a population from twenty to thirty thousand, the average budget is $10,000. The staff usually consists of a physician as health officer, a clerical office assistant, a public health nurse and a sanitary inspector. In some instances the towns within the county combine their public health activities with that of the county and contribute toward the maintenance of the budget. Larger units maintain a laboratory, employing one or more technicians, several nurses and sanitary inspectors. In a few instances one or more small counties have joined in the formation of a health district. By pooling their resources, they have been able to maintain a full-time health organization.

A number of state health departments, to encourage the maintenance of full-time county health departments, contribute toward their support, which usually does not exceed 25 per cent of their total cost, and seldom more than $2,500 in a single county. The United States Public Health Service and the International Health Board of the Rockefeller Foundation are also financially cooperating with a number of counties. Such aid is given through and in the name of the state health department. The assistance is granted for a temporary period, and is discontinued or gradually diminished over a period of from three to four years.

In the average rural county having a population of from twenty to thirty thousand, a health unit costing $10,000 annually can make measurable progress in the prevention of sickness, assuming that its personnel is well qualified for such work. In such a county the per capita cost will amount to about 50 cents, and if the property value is reasonably high, the yearly tax will amount to about 0.5 mill.

Now that such organizations have been functioning for several years in many parts of the United States, a fairly definite program of work has developed which is more or less common to all. Briefly, the activities consist of the control of filth-borne diseases through improving sanitary conditions. The work among school and preschool children consists of the examination for physical defects of those in attendance at the schools throughout the county, clinics for the correction of the defects, dispensaries for typhoid inoculations, diphtheria toxin-antitoxin treatments, and smallpox vaccinations, infant welfare clinics, conferences with expectant mothers, classes for instructions of midwives, epidemiologic investigations, and public health education. This constitutes the basic activities of the average full-time health organization. In counties with additional public health problems, such as hookworm and malaria, special attention is directed toward their control.

Municipal health departments, employing for their full time a trained personnel, having long since passed the experimental stage. Their importance is recognized by all. The same is rapidly becoming true in the cost of full-time rural health organizations, as is shown by their increase from year to year.

For a state health department to accomplish the maximum results in reducing the state death rate from preventable diseases, it is essential for at least its more populous counties to maintain a full-time health organization, employing a trained personnel. Subsidy by the state health department insures efficiency by eliminating political favoritism in the selection of the staff members of the county health unit, and provides the state health department with a logical means of expansion by supplying, at a minimum expense, field workers who are directly under their supervision. Though nearly all state health departments have adopted the policy of encouraging counties to maintain a full-time health organization, their development will continue to be more rapid in the states whose health department gives the counties the most encouragement and reasonable financial assistance.

SUMMARY

1. Until recent years the death rates in rural districts, as the result of many natural advantages, have been much lower than urban death rates.

2. The decline in the death rate of the registration area as constituted in 1900 indicates that the rural districts have lost this advantage as the result of superior health administration in the cities.

3. Surveys show country children to have more physical defects and give a history of having had more diseases than city children.

4. Nearly half of our population live in rural districts. Three fifths of our school children, approximately twelve million, attend country schools.

5. Adequate health protection for those living in rural districts should be furnished by the government, and of all governmental units, the county, with the aid of the state, is best suited to assume the responsibility.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. BISHOP AND COVINGTON

Dr. W. S. Leathers, Nashville, Tenn.: It will be well to emphasize the fact that in studying health problems of the state, Dr. Bishop finds that 81 per cent of the population is in fifty-four out of a total of ninety-five counties. There are a number of counties in Tennessee that are sparsely populated, but in dealing with the legislative body it becomes necessary to enlist the interest of representatives from all portions of the commonwealth, and for this reason it is essential, in projecting the plan of health work, to offer some scheme or method by which people in all parts of the state, even in counties such as those mentioned, may be benefited by the activities of the state department of health. It is obvious that it is more difficult to enlist the interest of people in counties that are not well populated in the expenditure of funds for the establishment of a county health organization. It is, however, imperative to have some plan that will give a degree of protection to the citizenship of such counties and with the objective of having a county or local health organization when conditions permit such advancement. I am confident that there are many counties in most of the states that present the same problems with which Dr. Bishop is confronted in Tennessee. The question then is, "What shall be done with a county that is not financially able to have what we regard as an ideal development; namely, a county health department?" The plan suggested by Dr. Bishop is to use a sanitary officer or an inspector, who may be a layman or a nurse, to do only environmental sanitation in order to breach the gap pending the more desirable development of health work. This work will require the improvement of sanitary conditions in and around the homes, the schools and places of public utility. The success of the work

will depend largely on having intelligent and well trained persons for such service. The University of Tennessee has made some arrangement for the training of inspectors, and after this training is obtained they may be tried out by being afforded definite opportunity for continued work in a county under the direction of a state inspector who may be placed in charge of this service for the state at large. There are, of course, some dangers in advocating a course of this kind. The health work of a county, regardless of what steps may be used in its development, should finally be placed in the hands of a medical man. I understand that in some states this plan has been attempted with discouraging results, while in other states it has been tried with a definite measure of success. Too much emphasis cannot be placed on affording opportunity for training persons who are to engage in work of this kind. A layman with reasonable intelligence, energy and common sense, and understanding the objective of the work to be done, should prove a success as an inspector, and could be used with advantage in counties that are sparsely populated, in the development of a more complete and efficient local health organization. In the use of sanitary inspectors in counties independently or in association with part-time health officers, it is essential that the state health officer use judgment to see that whatever activities are undertaken are determined by him, and that no health work be done by a health inspector which will involve directly medical service, the idea being that this method is particularly applicable in improving environmental sanitation, creating wholesome sentiment and stimulating the people to assume increased responsibility, even though it be a sparsely settled area, in the development of efficient health work. Such a plan may lead in time to three or four counties becoming grouped together into a sanitary district and placed in charge of a medical officer of health with nurses and sanitary inspectors.

DR. A. T. MCCORMACK, Louisville, Ky.: We in Kentucky are especially grateful because under Dr. Covington's leadership the original health departments, except the one in Jefferson County, were created and were inspired by him. In regard to the matter of the sanitary officer, in the plan suggested by Dr. Bishop I am in opposition. I am opposed to all substitutes and subterfuges by which somebody else, partly trained or half trained, becomes a substitute for a medical officer, a medical practitioner. The basic law of Kentucky gives me no option in the matter, the only person who is eligible for the county officer being a physician. We are trying to get out of the minds of the sanitary instructors that they are to go from place to place and only inspect. They find out what is wrong and stay there long enough to instruct the people as to what is right. We have had the public health nurse as our initial step toward the development of the all-time health department in more than half the counties of Kentucky, but the public health nurse and the sanitary instructor should be absolutely under the control and guidance of the health officer. Where that is done, the sanitary instructor can be used where a part time health officer absolutely controls the instructor, provided, as in Alabama or Kentucky, the health officer is the supervisor and controller. We are gradually increasing the number of our health departments. Recently a study was made of the state by a commercial organization employed by the state under the title of an efficiency commission. Their constructive recommendations have been extremely interesting. They urge the extension of the health departments in those counties where the half mill tax will enable them to be adequately supported on a budget of not less than $10,000, but in approximately one third of the state it will probably always be necessary for the state to exercise the active supervisory control of health education and health work. That is because those communities are too sparsely settled and not economically able to carry on minimum public health work with the minimum public health standard of efficiency that we should demand; and for that reason they urge that the state health department should be sufficiently equipped with educators and officers to enable them to get to these distinctly rural districts, that the population of them may be kept well and that they may be kept populated. The Alabama plan of operation is ideal. The responsibility for the construction of the public health program is put squarely and legally up to the medical profession of the state. We have attained approximately the same degree of recognition in Kentucky, but not so efficiently as in Alabama. We have been forced to take our health officers from the local physicians of the county in almost every instance. We started out with highly trained health officials, but we have been gradually forced to take the men who are practicing general medicine in the country districts of the county and send them over for training in public health work, and then bring them into our own office and work them there for a time and then put them back into the county from which they came, that they may know the geography and biography of the people among whom they are to work. Public health is needed as much as any other commodity, and the county health unit will enable us to put this necessity across to the people that live in these places.

DR. S. W. WELCH, Montgomery, Ala.: I was much impressed with the idea advanced by Dr. Leathers that it will be practically impossible to conduct a nonmedical unit without the strict supervision of the state health department. The selection of these nonmedical assistants or directors of public health in any county not only takes a great deal of care, but in the experience of Alabama has invited catastrophe. We have failed in every instance in which we have undertaken it. We have not been able to succeed at all without the personnel of a health officer and a secretary in the office to take care of the records, a public health nurse and a rural inspector. That takes a budget of about $10,000, and the system is just the same in the smallest as in the largest county in the state. In the county in which Birmingham is located there are between 300,000 and 400,000 people, and a budget of $225,000 is required. A mistake is frequently made in the choice of the personnel of the health department. I would rather have an Alabama physician; but if I cannot get one I want a man just out of school who has no affiliations or ideas that have crystallized through years of practice and association with a different type of people. He can be molded. That is one of the basic things in the success of Alabama. There must be sufficient personnel to do the work. One person in a rural county, it does not make any difference how brilliant he may be, how efficient he may be, cannot do work enough to get it over to the people that this thing is necessary. He cannot see enough people. He cannot visit homes enough, and in a rural population it is a home to home business. It is necessary to get into the homes of the people and get them personally interested. The sanitary inspector and public health nurse are of tremendous aid to the health department because they come in actual contact with people in their homes and in their everyday activities.

DR. J. A. HAYNE, Columbia, S. C.: Alabama has a very good system, but it was borrowed from South Carolina. In 1879 the state board of health was founded on principles that other states are now adopting. We have gradually returned to the basic principle that public health is essentially a medical problem and should be in the hands of the medical profession. Every now and then there are little excursions into the realm of getting a layman to do what the physician should do and it always ends in disaster. To take a man and train him for three months, even under the supreme leadership of Dr. Leathers, would not turn that man into an efficient health officer, and I believe it would be dangerous to turn such a man loose in a county to do as he pleased under the supervision of the state health officer, who is probably away attending some convention.

DR. G. M. ANDERSON, Cheyenne, Wyo.: I, too, disagree about placing a substitute for a physician. Social organizations, industrial organizations, women's clubs, parent teachers' associations, are all striving to the end that lay people be put in charge of public health work. It is vicious and wrong and dangerous for medical men even to intimate that we are thinking of countenancing such a thing or dreaming

of it. Out in Wyoming we do not have a colored problem, except the porters on the trains, and they do not have any definite residence, and there is no malaria or hookworm. Mosquitoes and hookworms do not do well in a climate of 30 or 40 degrees below zero, but we have an abundance of rural life and politics. These are our two leading problems, and we have found that the county health unit contends very efficiently with both of these troubles. Dr. Covington, representing the International Health Board, came to our state soon after I became health officer, met the council of our largest city and presented the matter of a county health unit. At once, while he was yet in the council room, the council passed a resolution, endorsing the plan and voting money; the county commissioners did likewise the next day, and so we started off with our first county health unit. It has been a tremendous success, and I am very sorry that we have not more of them in the state of Wyoming. The trouble in our state is that education has been lacking in public health. We have part-time health officers, but they are physicians, not laymen. As long as I am in the state and have any influence, there are not going to be any lay health doctors, because that is what they will be called. They call druggists and chiropodists doctors, and it won't be long before they will call these lay health officers doctors.

DR. E. L. BISHOP, Nashville, Tenn.: The sanitary officer is not at all intended to be a substitute for the county health department, and certainly there is not the slightest idea of making health officers out of laymen. Tennessee has a physician as full-time or part-time health officer in every county except one. The activity of the part-time health officer would be supplemented and not supplanted by the activity of the sanitary officer. With reference to training, especial emphasis is placed on training men in what not to do, rather than what to do, in order that they may have a clear idea of their limitations and not trespass on other fields of activity. In reply to Dr. Welch, I would say that these men will be under the most careful local and general supervision by well qualified men. Our problem in Tennessee is rather different from the problem in Alabama, in that with almost equal populations, Tennessee has ninety-five counties, as compared to only sixty-seven counties in Alabama. Then, too, there is a concentration of population in a few Tennessee counties, and as a result, a wide range of population between our largest and smallest counties, the extremes being a maximum of a quarter of a million, and a minimum of twenty-five hundred. As the population decreases, the tax rates increase; thus, we have a serious problem in the economics of our local full-time work, a problem that cannot be solved in its entirety by the county health department. We would be derelict in our duty if we did not attempt a solution.

DR. P. W. COVINGTON, Salt Lake City: Dr. Bowden emphasizes the difficulty of convincing county officials of the superiority of the full-time health department as compared with the part-time department, which is usually a health department in name only, as its activities are confined almost entirely to the treatment of the indigent sick. No doubt all who have been interested in the promotion of full-time rural health organizations have at times found it difficult to convince county officials of the importance of providing public health protection for those in rural districts. It is made difficult, as has been brought out, because of the less apparent need for such protection in rural areas as compared with urban, and because of the more limited financial resources in such areas. In promoting rural health organizations, those who have been most successful have conducted an intensive campaign throughout the county for the purpose of acquainting the people with the importance of such an organization prior to presenting it to the appropriating body—the county commissioners. When sufficient sentiment has been aroused, the commissioners as a rule act favorably. Drs. McCormack and Welch brought out an important point, that of selecting local physicians having the necessary training in preventive medicine and sanitation to fill the positions as full-time county health officers.

SECONDARY TUMORS OF THE BRAIN*

WALTER D. SHELDEN, M.D.
ROCHESTER, MINN.

Approximately 5 per cent of the tumors of the brain examined at the Mayo Clinic have metastasized from malignant disease elsewhere in the body. The precise frequency of these secondary tumors of the brain is doubtless somewhat higher, but only by universal necropsy service could accurate data be acquired. The occurrence of metastasis to the brain during the course of malignant disease, whether or not it is productive of symptoms, is of especial interest to the pathologist; but when a considerable number of patients present themselves for diagnosis with symptoms and signs of brain tumor as the initial evidence of malignant disease elsewhere, the problem is one of serious import to the physician. It is this phase of the subject of secondary tumors of the brain that I wish to discuss in the hope that an unsatisfactory state of diagnosis may be improved and that, if possible, the embarrassment of both diagnostician and therapist may be lessened.

When one is convinced that a patient has a brain tumor, its accurate localization is likely to absorb one's interest in the hope that it may be mitigated or eradicated by appropriate treatment. To ask whether this tumor may not be metastatic, especially when there is no complaint suggesting disease elsewhere, might appear to be an inquiry too remote to be practical. Yet the frequency with which the whole nervous system is directly involved by metastatic malignant disease is such that we have been impelled to extend the routine examination gradually in the hope that the source of the mischief may be located. Thus, the presence of brain tumor requires a careful survey of the body to locate or exclude malignant disease elsewhere, so far as possible. Too often marked mental and physical deterioration may hinder the carrying out of an examination as desired, and has occasionally interfered with the development of data which would have allowed an accurate diagnosis of the essential disease.

The organs of the chest and abdomen should be examined to learn whether their size, shape, location, consistency and mobility are normal. The bones, glandular system, skin, oral cavity and pelvic structures should be carefully investigated. Symptomless, small and indefinite masses in the abdomen or elsewhere, found by routine examination, should be examined repeatedly, because even though they may be dismissed in the beginning as of no significance they may later astound one by their size and importance. When possible, it is very advantageous to investigate the nature of all tumors removed in recent years by further microscopic study. A roentgen-ray examinaion of the lungs and head is very important as concerns both the internal organ and the skeletal portions. When evidence of secondary tumors is sought, such reports as healed tuberculosis, miliary tuberculosis, pleural adhesions, pneumonoconiosis and pleural effusions should be received with a suspicious reserve, and examination should be made at sufficient intervals to determine whether these signs are constant. The value of repeated examination is clearly proved when shadows make their appearance after previous plates have been negative. The lungs may be the seat of primary carcinoma, and it is particularly prone to metastasize to the brain

* From the Section on Neurology, Mayo Clinic.
* Read before the Section on Nervous and Mental Diseases at the Seventy-Seventh Annual Session of the American Medical Association, Dallas, Texas, April, 1926.

and meninges, and to the bones of the spine. When carcinoma begins near the periphery of the lungs, it may extend through the pleura without effusion and infiltrate the tissue of the chest, producing no symptoms, or it may infiltrate the brachial plexus near the spine and cause severe pain. Such extensions may long escape detection on roentgen-ray or physical examination. The lungs are also a frequent site of secondary tumors which may be recognized early by roentgen-ray examination. The roentgenogram of the chest also exhibits a goodly portion of the body skeleton, and in this may be seen secondaries of those tumors that select the bones. A roentgenogram of the head seldom gives evidence of secondary tumors in the brain, although the skull is quite often invaded by metastatic tumors, notably by hypernephroma. Suspicious signs in the bones of the chest or skull, themselves not diagnostic, should lead to further study of the osseous system for more positive data. Carcinoma of the nasopharynx often invades the skull, and its first clinical symptoms may be ocular palsy, chiasmal signs, or involvement of the fifth nerve and other cranial nerves. All brain tumors are sent to the rhinologist for study of the nasopharynx.

Roentgen-ray examination of the gastro-intestinal tract, cystoscopic and pyelographic examination of the kidney and its pelvis, and bronchoscopic examinations have been made at times in response to some vague symptom or suspicion, occasionally with success. Again we have been disarmed by negative findings when in fact a lesion was present. This is especially likely to occur in cases of hypernephroma, since when the tumor is small or located peripherally it may exhibit no signs or symptoms. In one case, slight hematuria suggested an examination of the kidney. It, however, appeared to be normal despite the presence of hypernephroma, which produced the secondary tumor of the brain which was unfortunately explored. It is manifestly impossible to submit all cases to such a full investigation, yet to this restriction and to the imperfection of our technical methods must be charged our inability to reveal the correct sequence of the disease. Often circumstances are such that a period of observation sufficiently long to allow reexamination at reasonable intervals, especially roentgenologic examinations of the lungs, is impossible. Our anxiety to relieve the patients may also urge us to undertake surgical measures which at best would be but slightly palliative.

The literature on this subject is quite extensive, and by reference to the articles of Spiller and Weisenburg,[1] Hassin and Singer,[2] and Barron,[3] the important contributions may be found.

The histories of two patients are given in some detail to illustrate the clinical problem. The remainder have been tabulated in appropriate groups (tables 1, 2 and 3).

ILLUSTRATIVE CASES

CASE 1.—A man, aged 40, came for examination, March 4, 1924. Five months before, he began having "catches" or "stitches" in the right hip. Two weeks later he had an attack while at work in which the right leg drew up in a spasm, which lasted for several minutes. After a short interval another similar attack occurred, and he stopped working. Thenceforth, there was a definite, increasing drag in the right leg in walking. Ten days after the weakness appeared in the leg, the patient found on awakening that the grip in the right hand was weak. During the next six weeks this gradually improved, although slight weakness persisted. During the five months he had a dull left frontoparietal headache almost every morning, which lasted for several hours. Failure of vision began about one month before his examination, and was progressive. Two weeks later he had diplopia for about one week. During the week of examination he had four jacksonian attacks. Convulsive movements began in the right foot, right thigh and right arm. About five weeks before, he had a similar attack. During the last few years he had been drowsy and stupid.

The general physical examination was negative. The urine was normal except that blood and a few pus cells were found on three examinations of the sediment. The roentgenogram of the chest was negative, and that of the head suggested erosion of the left frontoparietal area. The blood count was normal, and the Wassermann tests of the blood and spinal fluid were negative. The vision of the right eye was 5/60, and of the left eye 1/60; both pupils reacted sluggishly to light; the fields were negative; the blind spots were markedly enlarged, and there were bilateral choked disks, right, 3 diopters, and left, 4 diopters.

Because of the blood in the urinary sediment, an examination of the kidney was requested. The roentgenogram of the kidney was negative. Both ureters were catheterized, and bloody urine was obtained from both. No pyelogram was taken. The diagnosis of the urologist was mild pyelonephritis. The right hand showed slight weakness, the right hand and calf complete paralysis, and there was also marked weakness of the right thigh. The reflexes in the right arm and leg were quite exaggerated, and there was no response on stimulating the right sole. The reflexes on the left side were normal. Sensation was normal so far as could be determined in the patient's drowsy mental state. The coordination of the right hand was quite impaired, and paralysis of the right leg prevented a satisfactory test. The evidence for brain tumor was quite plain. Our suspicions were aroused by the roentgenogram of the head and the bloody urinary sediment, but the examination seemed to explain the matter. The roentgenogram of the chest failed to reveal disease in the lungs.

The upper left rolandic area was explored, but no lesion was found. The patient developed Cheyne-Stokes respiration and died the following morning. Necropsy examination disclosed carcinoma of the right kidney, with metastasis to the lungs and left cerebrum.

CASE 2.—A man, aged 50, came for examination, Oct. 20, 1923. Ten weeks before, when his team ran away, he was thrown to the pavement and rendered unconscious for about half an hour. A laceration of the right forehead caused by the fall was repaired by suture. After the accident, he had a continuous right frontal headache. The day following the injury, weakness in the left leg was noted. Two weeks later the left hand became uncertain in its movements, and then the weakness in both extremities gradually progressed. During the last six weeks when there were paroxysms of more severe headache he noted tingling and jerking in the left arm and leg. He was dull and apathetic.

The general examination was negative. The urine was normal. The roentgenograms of the head and chest were negative. The vision was 6/30 in both eyes; pupils, reflexes and fields were normal. The left disk was hyperemic; the right disk showed early evidence of a choked condition. The right blind spot was enlarged. The patient had well marked hemiplegia on the left, bilateral Babinski and Chaddock signs, increased reflexes on the left side, and a slight reduction of pain and tactile sensibility on the left side.

November 5, exploration was made over the right motor area. No massive hemorrhage was found, but considerable blood was found beneath the arachnoid, and the convolutions had a hemorrhagic appearance. In view of the progressive paralysis and early choked disk, it was seriously doubted whether this sequence was entirely due to the injury. It seemed possible that the accident was due to an epileptiform seizure which was the initial symptom of a tumor. There

1. Spiller, W. G., and Weisenburg, T. H.: Carcinoma of the Nervous System, with the Report of Eleven Cases, J. Nerv. & Ment. Dis. **33**: 500-524, 1906.

2. Hassin, G. B., and Singer, H. D.: Histopathology of Cerebral Carcinoma, Arch. Neurol. & Psychiat. **8**: 155-171 (Aug.) 1922.

3. Barron, Moses: Carcinoma of Lungs: A Study of Its Incidence, Pathology and Relative Importance, with a Report of Thirteen Cases Studied at Necropsy, Arch. Surg. **4**: 624-660 (May) 1922.

was no evidence of malignant disease elsewhere. The operative findings did not explain the syndrome satisfactorily. For a few days following the operation the patient seemed somewhat improved; then he declined gradually, and died a month later.

Necropsy examination, December 3, revealed carcinoma of the left kidney with cystic metastasis in the right parietal area, metastasis to the lungs, pleura and suprarenals, and terminal bronchopneumonia.

CLASSIFICATION OF CASES OF METASTATIC TUMOR OF THE BRAIN

Cases of metastatic tumor of the brain may be readily arranged in four groups.

Thus, evidence was attainable on physical examination of six of the patients which determined the presence of secondary tumors elsewhere or localized the primary lesion. In three cases the symptoms were confined to the nervous system and unfortunately exploration was performed. In two of the three patients the roentgenograms of the lungs appeared negative, whereas at necropsy metastatic lesions were present. In one of the patients operated on no roentgenogram of the lungs was taken, and this patient had primary carcinoma of the hilum of the lung. Such experiences have taught the importance of roentgen-ray examination of the lungs, and it is now a routine procedure. A roentgenogram of the skull is important, as table 1 shows, although in two cases the metastatic lesions were palpable. In seven cases the primary lesion was not found during life. In case 10 the primary lesion may have been covered by the pleural effusion. Two guinea-pigs were inoculated with pleural fluid and neither developed tuberculosis, nor could bacilli be found in the fluid. In case 4 the physical signs at the left apex strongly suggested a tumor, but the roentgenologist interpreted the "dense infiltration of both lungs" as

TABLE 1.—*Metastatic Tumor of the Brain: Group 1*

Case	Age, Years	Onset of Symptoms Before Examination, Months	Duration of Symptoms, Months	Principal Symptoms and Signs in Order of Occurrence	Roentgen-Ray Observations	Necropsy Observations
1	40	5	5	Headache; jacksonian attacks; right hemiplegia; choked disks	Lungs normal.....	Hypernephroma with metastasis to left frontal lobe and lungs
2	50	2.5	4	Injury to head, headache; progressive hemiplegia; choked disks	Lungs normal; head normal	Hypernephroma; metastasis to right parietal, lungs, pleura, suprarenal and lymph glands
3	40	12	13	Headache, vomiting; vertigo; weakness of right arm; right Babinski; choked disk	No ray.....	Primary carcinoma of lung; multiple metastasis to brain, lungs, liver and glands in general
4	50	12	13	Headache, diplopia, paralysis left external rectus; stiff neck; dulness and swelling around first rib; enlarged gland above clavicle	Miliary tuberculosis; dense infiltration of both lungs	Primary carcinoma of lung; tuberculosis of lungs; carcinosis of pia-arachnoid
5	55	3	3	Depression, worry; (sugar in urine twice); delirium; stupor	No ray (too ill)...	Carcinoma of pancreas; metastasis to lungs, brain, liver, and general
6	13	6	8	Choked disk; tumors on skull	Metastasis to lungs and skull	Hypernephroma with metastasis to left suprarenal, lungs, and general
7	8	4	4.5	Hydrocephalus; exophthalmos; choked disk	Metastasis to skull	(Died four days later)
8	27	8	16	Left frontal headache; pain left side of face, anesthesia and paralysis left, 5; left ptosis, left total ophthalmoplegia; four months later abdominal mass	No ray.....	(Died eight months later)
9	32	24	7	Headache, failing vision; choked disk (tumors on skull); enlarged glands; many palpable tumors	Metastasis to skull	Hypernephroma; no necropsy
10	29	2	3	Convulsion; headache; vomiting; bloody fluid in chest; choked disk	Fluid in chest, primarily in lung?	(Died six weeks later)

TABLE 2.—*Metastatic Tumor of the Brain: Group 2*

Case	Age, Years	Onset of Symptoms in Central Nervous System, Months	Principal Symptoms and Signs in Order of Occurrence	Diagnosis	Roentgen-Ray Observations	Necropsy Observations
1	58	5	Numbness left face; deafness left ear; ptosis left; diplopia; gland in neck; left ophthalmoplegia; blind left eye	Lymphosareoma of nasopharynx	Lungs normal; head normal	Verified at necropsy performed by home physician two months later
2	43	2	Pain left face; diplopia; gland in neck; anesthesia left fifth nerve; palsy left external rectus; left ptosis	Carcinoma of nasopharynx	.....	Died two months later; no necropsy performed
3	49	12	Diplopia; pain right ear and eye; anesthesia right fifth nerve; motor paralysis fifth nerve	Carcinoma of nasopharynx first discovered four years ago	Chest normal; head normal	Died fourteen months later, December 19, 1921
4	41	6	Diplopia; pain left eye; hoarseness, numbness left face and tongue; gland left neck; fifth, sixth, ninth, tenth and eleventh nerves involved	Carcinoma of nasopharynx	.....	Died two months later; no necropsy performed
5	40	4	Occipital headache, dizziness, vomiting, failure of vision, ataxia; choked disks; hard thyroid	Carcinoma of thyroid	Metastasis to lungs	Died four months later; no necropsy performed
6	32	3	Bloody sputum, pleural effusion, headache, failure of vision, diplopia, ataxia left arm; right Babinski; several tappings of pleura; effusion bloody	Malignancy, primary?	Fluid in lungs	Neurobiastoma, both suprarenals; general metastasis to brain and lungs

GROUP 1.—This group is composed of cases of latent malignant disease, the initial symptoms of which are due to cerebral metastasis. Table 1 gives the important data concerning the ten cases that are of especial interest in this paper.

As the table indicates, the span of life following the onset of the symptoms is unusually short in cases of brain tumor. All the patients presented themselves quite late in the course of their illness, enabling us to see nearly the full evolution of the clinical picture.

tuberculosis. Gross and microscopic examinations at necropsy revealed both carcinoma and tuberculosis. In case 8 an abdominal mass with ascites was found a year after the symptoms began. Patient 7, a child with hydrocephalus and choked disk with metastasis to the skull, died at home shortly after dismissal, and necropsy was not performed.

GROUP 2.—This group is composed of cases of malignant diseases which are symptomless but demonstrable on examination, and the initial symptoms of which are cerebral. In this group are included the cases of carcinoma of the nasopharynx, and two cases of carcinoma of the thyroid (table 2).

GROUP 3.—In this group belong the cases in which malignant tumors have been surgically removed, and cerebral symptoms are the first evidence of recurrence. There were eight such cases: three developed following removal of carcinoma of the breast, one each from carcinoma of the sigmoid, hypernephroma, sarcoma of the testis, malignant mole, and tumor of the parotid gland (table 3).

GROUP 4.—In this group are the cases of malignant disease which, during its clinical course, metastasizes to the nervous system, with or without the production of definite symptoms. There are sixteen cases in this group, fourteen of which present a variety of signs and symptoms of involvement of the brain. Necropsy revealed carcinoma of the dura, pia and arachnoid in one case, and metastatic tumors of the brain, dura and skull in another. In two cases at necropsy there were latent secondary tumors. As these cases are of secondary interest to the clinician, they were not tabulated.

To these groups might be added another which is of clinical interest, but not strictly a part of this subject. I refer to cerebral affections which may complicate the course of malignant disease yet have no definite relation to it. The manifestations in a number of such cases were attributed to metastasis to the brain, but as several patients have lived longer than they could with metastasis, it is more than likely that such symptoms had an origin unrelated to the local malignant disease. Several writers have described cases with cerebral symptoms during the course of carcinoma in which there was no evidence of invasion of the nervous system by carcinoma at necropsy to explain them. Such symptoms have been ascribed to some toxic influence exerted by the carcinoma. Thus far I have had no experience with such cases.

TABLE 3.—*Metastatic Tumor of the Brain: Group 3*

Case	Age, Years	Operation	Cerebral Symptoms	Roentgen-Ray Observations	Necropsy Observations
1	46	Carcinoma of sigmoid two years ago	Recently mental symptoms, nystagmus, ataxia....	.....	Recurrence in abdominal wall, inguinal glands, left lung, right cerebellum
2	40	Mole, one year ago and five months ago	Ten days ago, delirium, headache, vomiting; fundus negative; no focal signs	None.....	Melano-epitheliomatosis; much metastasis to brain; general
3	55	Carcinoma of left breast two years ago	Two months ago, headache, progressive weakness of left hand and leg; left hemianesthesia; biopsy of axillary gland, carcinoma	Lungs normal; head normal	Death reported three months later
4	55	Hypernephroma six years ago	Five months ago, weakness of right leg, then right arm; convulsions 2; headache, mental impairment	Metastasis to lungs	Death reported two months later
5	23	Right parotid tumor operated two years and one year ago	Eight months ago, headache, vomiting, diplopia, choked disk; ocular palsy; atrophy left twelfth nerve; blind left eye; Babinski sign	None.....	No report
6	28	Sarcoma of left testicle six months ago	Six weeks ago, failure of vision; pain in eyes, blind, choked disk, abdominal mass	Mass in mediastinum	Death reported three months later
7	42	Carcinoma of left breast three years ago	Four months ago, cramping and weakness right foot. Four weeks ago right hemiplegia; improved; headaches for two months; jacksonian spells; choked disk	Lungs normal	No report
8	55	Carcinoma of right breast two years ago	One month ago, weakness of left arm, then left leg; speech poor; headache for three weeks, vomiting; fundus normal	Metastasis to lungs	No report

CONCLUSIONS

1. Metastatic tumors present no essential characteristics which distinguish them from primary tumors of the brain.

2. All patients presenting evidence of brain tumor should be carefully studied for evidence of secondary tumors or a primary tumor elsewhere.

3. Roentgenograms of the chest and skull should be taken as soon as symptoms suggesting brain tumor appear, both for their immediate value and for comparison wtih later studies.

ABSTRACT OF DISCUSSION

DR. PETER BASSOE, Chicago: To my knowledge there is little in the literature about metastatic hypernephromas of the brain and metastatic brain tumor secondary to tumor of the lung. I think that all of us who have had the opportunity to see cases of metastatic carcinoma of the brain have been annoyed at the failure to recognize the primary tumor. It has struck me that there is, perhaps, no kind of brain tumor in which there may be such extensive growth in the brain with so little increase in brain weight and brain volume and so little prominence of the general symptoms of brain tumor. I have had that impressed on me several times when as much as two thirds of a hemisphere has been replaced by carcinoma, and the brain not materially changed in shape or weight. We then are likely to think that the patient has some other kind of lesion than a tumor. One such patient that I saw was a woman who went to the railway station to buy a ticket and could not remember the name of the station she wanted to reach. She was referred to the matron there and sent out to the hospital. We found that the patient had been at the same hospital some years before and had a carcinoma of the breast removed; so there was every reason to suspect that she had metastatic carcinoma of the brain, but there were no symptoms except the aphasia. There was no hemiplegia, no choked disk; yet the tumor was very large. I do not know of any kind of brain tumor in which I have so often had a report of a false positive Wassermann test where necropsy failed to reveal any sign of syphilis. I remember one patient who had a right hemiplegia and aphasia, and no signs of a primary tumor. A brain tumor in the left hemisphere was found. The patient died a week later and there was a tumor three times as large on the other side.

DR. WILLIAM HOUSE, Portland, Ore.: A thought that I believe Dr. Shelden has not suggested is that metastatic tumors of the brain tend to be multiple much more frequently than primary tumors. Multiple tumors are frequently difficult of localization. If there are symptoms pointing to a brain tumor that we cannot localize, we should always think of

multiple tumors; and whenever we think of multiple tumors, it is wise and proper to think of them as probably metastatic, and therefore, as Dr. Shelden has suggested, usually not operable. Moffitt, in 1911, discussed a number of cases of hypernephromas, in many of which there were metastases to the brain. He commented particularly on the salmon tint of these secondary tumors. Shortly after hearing his paper, while doing a necropsy which by agreement was to have been limited to the brain, we found a tumor having this peculiar tint. This suggested the probability that it was a hypernephroma, metastatic in origin, and on further search the original lesion was found in the right kidney. Melanotic sarcomas, more frequently than is supposed, cause metastases in the brain. Sometimes the original lesion is very small or in some obscure place. About a year ago I saw a patient who obviously had a brain tumor. Half a dozen competent men had gone over the patient without discovering any other lesion except what were thought to be a series of bruises. In placing our finger on one of these, it was noted that there was a mass about the size of a bead with rings of discoloration about it. This was removed and proved to be a melanotic sarcoma, which was but one of a number of other deep-seated lesions in the musculature from which the cerebral neoplasm was undoubtedly secondary.

DR. A. L. SKOOG, Kansas City, Mo.: Of my comparatively few cases of multiple tumors of the brain, I have two that remain vividly in mind. In one case a primary tumor of the breast had been removed about four years previous to the onset of a paraplegia. Diagnosis of carcinoma of the vertebrae was made and proved by roentgen ray and later necropsy. Also, during the course of observation, some brain symptoms appeared, and a diagnosis of metastases to the brain was made. These metastases in the brain were also proved by necropsy, and the interesting feature of it was that the type of cells in the brain, in the vertebrae and in the skull corresponded exactly to the adenomatous cellular type found in the mammary gland. Another interesting case was one of a man who came in with evident symptoms of brain tumor, including choked disk, greatly increased pressure in the cranium, violent headaches, and vomiting. Localization was made by Sir William Gower, and one by Sir Victor Horsley; and several of the other staff men examined the patient. Operation was performed by Sir Victor Horsley, and a tumor removed where one of the localizations was made. This proved to be a carcinoma corresponding to glandular tissue somewhere. The man died about two months later. Necropsy revealed thirty or forty tumors scattered through the brain, and each man had the pleasure of having his localization verified. Furthermore, the tumors corresponded to an innocent looking small one in the sigmoid region that apparently never had given rise to any symptoms.

DR. GEORGE W. HALL, Chicago: One point that needs further emphasis is the fact that the primary lesion in the lung is frequently overlooked. I have had the privilege of seeing two cases in the last six months, one less than a month ago, both of which went to necropsy. One was in a woman who was operated on for carcinoma of the sigmoid two years previously. She came into the hospital with a definite brain lesion, and because of the history the diagnosis of carcinoma of the brain was made, but in the endeavor to connect it with the operation two years previously, we found a difficult problem, because there was no localizing evidence of recurrence in that region. The internist looked over the lungs very carefully, but was unable to detect any lesion. But the roentgen-ray examination showed the lesion present in the lung. So I should like to emphasize still further the importance of the roentgen-ray examination of the lung even in the absence of clinical signs. The second important thing that he brought out was the extreme rapidity of these cases in running their course. These two patients were under observation in the hospital only three weeks before they died, and necropsy showed the lesion in the brain. Another thing is that unless one is able to find the primary lesion one will not make a diagnosis. The chances are that a diagnosis of something else, such as a diffuse encephalomyelitis, will be made, and necropsy will show a carcinoma of the lung with secondary lesions in the brain. In those few cases I have seen, the eyegrounds gave us no information whatever. The appearance of the disk was apparently normal.

DR. HARRY L. PARKER, Rochester, Minn.: The phase of the problem I was particularly interested in was involvement of the central nervous system secondary to carcinoma of the lung. I was able to collect four cases in which this had occurred. In one case there was involvement of the spinal cord and vertebrae; in another, involvement of the posterior roots of the upper dorsal region, in a third case involvement of the brain, while in the last case there was involvement of the meninges. As brought out by Dr. Hall and Dr. Bassoe, in some of these cases of carcinosis there may be very little evidence of increased intracranial pressure. This was manifest in the one patient whose brain was literally peppered with carcinoma nodules. It has been suggested that the carcinoma dissolves or destroys the brain so completely that there is a substitution of tumor for brain substance rather than a pressing aside of the brain material. That is, in the aggregate there is no increase in the intracranial contents. The destroyed products are carried away by the phagocytes in the blood stream. This was evident in one of those four patients. It was very difficult in those four cases to find the primary carcinoma. In one patient that Dr. Shelden has mentioned, there were tuberculosis and a primary carcinoma developing from the tuberculosis, but the patient on two occasions had a positive Wassermann reaction, which is in accord with what Dr. Bassoe has said. This made a complicated and difficult problem of whether the patient had tuberculosis and tuberculous meningitis, or whether she had carcinoma with carcinomatous meningeal involvement, or whether it was a case of syphilis. As a matter of fact, at necropsy there were no evidences of syphilis, but a few carcinoses of the brain. In the other case the lung was not examined roentgenologically, and we missed it. However, in these lung carcinomas the growth starts from the hilum and spreads throughout the lung. Unless the carcinoma has grown beyond the margins of the sternal shadow, it may be completely missed by the roentgen ray.

DR. WALTER D. SHELDEN, Rochester, Minn.: The pathology of secondary tumors of the brain has been well written by Spiller, Weisenburg, Singer, Barren and others. I am interested in presenting the clinical side of the subject as a caution against accepting the diagnosis of brain tumor as final when symptoms of headache, choked disk and vomiting are presented in the initial examination of the patient. The assumption that the case is a primary tumor of the brain is to be taken with reservations. We have made the practice of considering brain tumor as secondary until we can prove, as far as possible, that it is not, and that has been our clinical attitude and the one I wanted to emphasize as important for everybody. Another thing that I think is important from the standpoint of the neurologist is that one must not accept the diagnosis of an internist as final. When they see the patient presenting history and definite evidence of brain tumor, they are rather careless about their general examinations, as a rule, and we have made a practice of going over our patients to see that they have no tumor elsewhere, even though a negative examination is reported by the internist. I also want to emphasize the importance of routine examination of the lung by roentgen ray. The earlier it is made, the better for all purposes of value. It is valuable for immediate information, but it is equally and perhaps more valuable as a basis of comparison in further observation of the case, because if a patient develops a metastatic tumor in the brain, he is very likely to have also metastatic tumor in the lung. This may be negative on first examination, but in the course of a few weeks it may be revealed, and that, of course, is crucial. Some one asked about choked disk. I am not positive nor have I any definite information about the relative frequency of choked disk in secondary tumors. It comes with sufficient frequency to be very confusing. It is absent, true, in a number of cases, but that can be said of brain tumor whether primary or secondary.

RADON (RADIUM EMANATION) AS A PALLIATIVE AGENT IN THE TREATMENT OF INTRA-ORAL CANCER*

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In intra-oral cancer, when should the primary lesion be submitted to surgery and when to irradiation? Evidently the operable lesions may be excised and the inoperable ones should receive irradiation. The greatest difference of opinion exists, however, as to what cases are really operable and what are inoperable. Judd and New[1] of the Mayo Clinic rightly state that the statistics of the operative treatment of intra-oral cancer will depend largely on what one considers operable and inoperable. Some take the position that in dealing with the primary lesion in intra-oral cancer, surgery has no place at all. Others take a diametrically opposite view and believe that only in the hopelessly advanced cases should irradiation be done, and that in all other cases operation should be performed. Our position is that distinctly operable cases may receive the benefits of surgery, and all other cases should be treated with radon.

What are operable lesions? Those that are small, well localized, easily accessible and do not involve any important anatomic structure. What are inoperable lesions? Large, ill defined and inaccessible lesions, such as those involving the base of the tongue, the pharynx, the palate and the tonsil.

METHOD OF TREATMENT WITH RADON

Radon is a gas and is extracted from an aqueous solution of radium chloride by a special apparatus. At least 1.5 Gm. of radium element should be contained in the solution used for this purpose. The rays that are emitted by a tube of radon are identical with those that are given off by a tube containing radium. Differing from radium, however, radon quickly decays, losing 16 per cent of its power every twenty-four hours. Some of the advantages of radon over radium itself are:

1. A large dose (1,000 or more mc.) can be concentrated over a small lesion. This is of the greatest practical importance because it allows one to shorten the time of exposure. A short exposure with a large quantity of radon is essential to success.
2. Bare glass tubes containing radon may be introduced directly into tumor tissue. In certain cases, this procedure is of great value and may even be necessary for success, as in tongue cancer.
3. If a radon tube is lost it is not a calamity, as it has little or no intrinsic value

TECHNIC

Our technic in the last seven years has naturally varied somewhat from time to time. Our usual technic is as follows:

If we decide to use surface irradiation alone, approximately 1,000 mc. screened with 2 mm. of silver and 2 mm. of rubber is applied to an area of from 4 to 6 sq. cm. for fifteen minutes. Great care must be taken not to rub or traumatize the lesion. Sometimes a lesion is of such irregular contour that several applications must be made in order effectively to irradiate the area. In such cases, regard must be paid to the overlapping of the irradiations.

If we decide that the patient should also have intratumoral treatment, we first apply a preliminary surface irradiation with 1,000 mc. in order to minimize the danger of metastasis. We regard this procedure as very important. Under local anesthesia, we then implant bare glass tubes, each containing from 0.5 to 1 mc. of radon, 1 cm. apart evenly throughout the lesion. These are allowed to remain in the tissues. The tubes either become encysted or slough out in the course of the healing process. A small piece of tissue for microscopic examination is taken with a small, sharp punch immediately after the first powerful irradiation.

Protection of the Operator.—Those who handle daily large quantities of radium may suffer from local and from constitutional effects. To guard against local effects on the fingers, nurses always handle radon tubes with rubber covered forceps 12 inches (30 cm.) long. To guard against constitutional effects we have devised movable lead angle plates, each weighing about 300 pounds (136 Kg.), behind which the head of the patient is placed while the nurse is making the application.

Fig. 1.—Epithelioma of tongue, before and after treatment.

The danger point in intra-oral cancer lies most frequently in the lymphatic glands of the neck. In the irradiation treatment of lymph nodes, blocks of soft wood, which may measure 4 by 4 by 4 cm., are used as radon carriers. One of these blocks is strapped to the skin, and a flat metal box, which may hold from twenty to fifty or more tubes of radon, is applied to its superior surface. At a distance of 4 cm., 1,000 mc. may be applied for seven hours. For the protection of the patient, we use a heavy movable lead shield which fits around the wooden block carrying the radon and is suspended above the table on which the patient lies.

REPORT OF TREATMENTS

Between Dec. 31, 1919, and Dec. 31, 1922, we used radon treatment in fifty-six unselected cases of intra-oral squamous cell cancer. None of the cases could be regarded as being favorable for operation. In

* Read before the Section on Radiology at the Seventy-Seventh Annual Session of the American Medical Association, Dallas, Texas, April, 1926.

1. Judd, E. S., and New, G. B.: Carcinoma of the Tongue: General Principles Involved in Operation and Summary of Results Obtained at the Mayo Clinic, Surg. Gynec. Obst. **36**: 163 (Feb.) 1923.

each case, the clinical diagnosis was confirmed microscopically.

Age and Sex.—The ages ranged from 29 to 71, the average age being 58.7 years. There were fifty-two men and four women.

Duration of Disease.—The disease was said to have existed for periods of from one month to three years, the average duration being 5.3 months.

Site of the Lesion.—The location of the disease was as follows: tongue, nine cases; floor of mouth, three; buccal mucous membrane, seventeen; superior maxilla, eight; inferior maxilla, seven and palate and tonsil, twelve. Cancer of the lip and cancer of the bone are not included in this report.

Lymphatic Involvement.—In twenty-nine cases there were palpable lymph nodes in the neck. In twenty-three cases, the submaxillary nodes and in four cases the cervical nodes were apparently affected. One patient

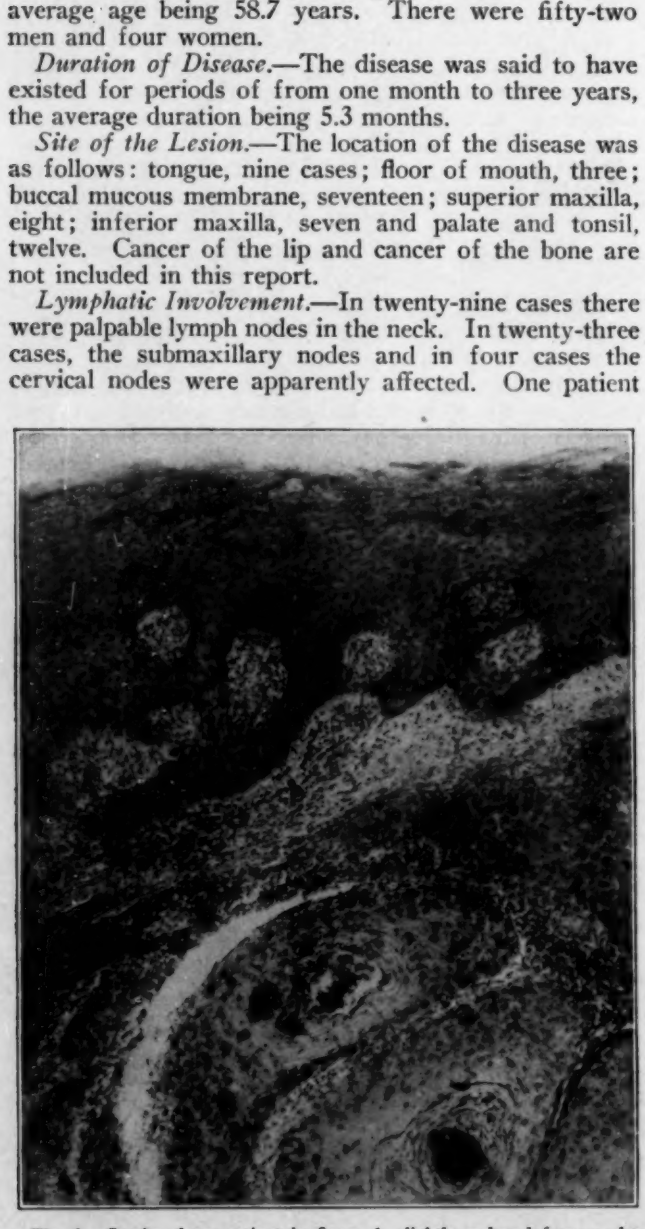


Fig. 2.—Section from patient in figure 1, slightly reduced from a photomicrograph with a magnification of 95 diameters.

had palpable submaxillary and submental nodes. In one case, there were palpable submental and cervical nodes. In twenty-seven cases, no definite nodes could be detected.

Results.—Thirty-nine of the fifty-six cases have been carefully traced. Of these, twenty-one patients had definitely palpable lymph nodes at the time of treatment. In eighteen cases no nodes were found.

Patients with Nodes.—Of the twenty-one patients with nodes, two are living, one having been well for over five years and the other for over four years. Of the nineteen patients with nodes who have died, the majority were improved for a time. The duration of life after treatment varied from four months to three years, the average duration being 16.4 months.

Patients Without Nodes.—Of the eighteen patients without nodes, fourteen, or 77.8 per cent, are living; four have been well for more than five years; five for more than four years; five for more than three years. Four patients are dead. One of these lived for twenty months. Three lived for more than three years after treatment, but all died eventually of recurrence of the disease.

Results in Cancer of the Tongue.—Of the nine patients with tongue cancer, six had palpable nodes in the neck. Two of these are living. Of the three patients without nodes, two are living. The four living patients with tongue cancer have been well for five years; four years; three and one-half years and three years, respectively. Of the five patients who died, two were free of cancer at the time of their death, one having been well for more than four and one-half years, and the other for more than one and one-half years. Three patients received only temporary benefit.

General Results.—Assuming that the seventeen untraced patients are dead, the total mortality among fifty-six unselected patients is thirty-six, or 63.3 per cent.

Twenty patients, 35.7 per cent, have been well for periods of from three to five years, the average duration of freedom from symptoms of cancer being three years and nine months.

59 East Madison Street.

ABSTRACT OF DISCUSSION

Dr. Francis Carter Wood, New York: This paper illustrates two points: one, what we ought to have, and one, what we ought not to have. We ought to have, and would be glad to have, a record of results, and, I think, these results are extremely good. But I should like to have, in addition, much more detail concerning the cases. If the question is going to be definitely worked out as to exactly what form of treatment shall in the future be applied to tumors, we shall have to know a great deal about the clinical history, the site of the tumor, its microscopic morphology, and whether the lymph nodes are involved or not. If we can determine by any means that there is a type of cancer of the tongue which is local, fairly benign, and does not metastasize to the nodes of the neck, that type belongs to the radiologists. The types, however, that metastasize easily, if operable, belong to the surgeons. If borderline, they should be treated by radium needles in the tongue and by prompt excision of the complete lymphatic system of the neck. It is wrong to leave these patients without such neck dissection, because by the time the nodes become palpable the patient usually is inoperable. Nothing has been gained by curing the primary tumor. It has seemed to me that there are many times when the nodes should be removed first before cancer of the tongue or cheek is treated with radium. For if the radium treatment is done first, the patient gets temporary relief or a complete disappearance of the tumor and then refuses further treatment.

Dr. Albert Soiland, Los Angeles: We must first learn the type of cancer we are dealing with before we can intelligently apply the radiation. The new opportunity we have to use is the gold and platinum radon implants, but it is as yet an untried experiment. That is to say, it has not been used long enough for us to evalute its possibilities. This offers a compromise between the bare emanation needles and the method of Professor Regaud with highly filtered radiation.

Dr. Sanford Withers, Denver: Aside from the pathologic features that have been mentioned by Dr. Wood and Dr. Soiland, I want to call attention to some further methods of the application of radium in cases of intra-oral cancer. The statement was made that in order to treat these types of growths successfully one should have in the neighborhood of 1.5 Gm. of radium and use large amounts of this agent for a short period of time; and yet I suppose that the best results that have heretofore been reported on the treatment of intra-

oral cancer were those of Regaud, who had somewhere in the neighborhood of 40 per cent of carcinomas treated that were well over five years. At any rate, Dr. Regaud uses well filtered radiation equivalent to at least 0.5 mm. of platinum, which filters out almost all beta radiation, and instead of using radium implants over a short period of time he uses it over a period of from one to two weeks in small needles, containing from 1 mg. up to 6 mg. I believe that the use of smaller radiating foci, such as are used by Regaud, is a definite contribution to radiology in this country from this investigator's work. For the last two or three years I have been using from 3 to 5 mg. needles of radium element, encased in platinum-iridium from 0.2 to 0.5 mm. thick, and have been carrying out treatment over at least a period of a week. I think the results are better in doing this.

DR. J. M. MARTIN, Dallas, Texas: In the treatment of oral malignancy, my experience has been confined almost altogether to the use of electrothermic coagulation.

DR. ROY E. FLESHER, Chicago: We agree with Dr. Wood that the result of radium treatment of intra-oral cancer will depend a great deal on the type of tumor, but it also depends on how much radium one has and how one uses it. Certain tumors are more malignant than others. Some are relatively benign, and in some one does very little for the patient. The same is true of the lymph nodes. The results in intra-oral cancer will depend a great deal on the lymphatic involvement. When squamous cell cancer metastasizes to the lymph nodes of the neck, the chances of the patient's getting well are limited. This is especially true if more than one group of glands is affected, or if the malignancy has broken through the capsule of the lymph gland. For patients in this condition the outlook is practically hopeless whether surgery is resorted to or radium alone is used, although life may be prolonged.

FLUOROSCOPIC VISUALIZATION OF TUBAL PERISTALSIS IN WOMEN

UTEROTUBAL ROENTGENOGRAPHY WITH LIPIODOL

I. C. RUBIN, M.D.
AND
A. J. BENDICK, M.D.
NEW YORK

Tubal peristalsis in women, in spite of abundant opportunity for observation, has so far not been observed or described as occurring during laparotomy. This physiologic function of the fallopian tubes has been assumed by embryologists and physiologists to be a necessary factor in the transportation of the ovum. Recent work on animals and on the extirpated and surviving uterus and tubes has actually established the phenomenon of tubal peristalsis. The experiments of Keye,[1] of Corner and his associates [2] Seckinger [3] and Snyder,[4] and of Sun,[5] Lee [6] and Hartman [7] of the Carnegie Embryological Institute of Washington, D. C., have demonstrated rhythmic contractions of the oviducts in the commonly employed experimental animals. Corner has shown the same to be true of the extirpated but surviving tubes of monkeys and of the human species. The results were corroborated more recently by Rudolph Kok,[8] von Mikulicz-Radecki [9] and Dyroff.[10] The latter author injected lipiodol into the uterus of a patient to test the patency of the tubes. The lipiodol entered the peritoneal cavity, in which it was diffused between coils of intestines. But the fluid remaining within the tubes cast shadows on the film, which he described as "pearls" of unequal length separated by constriction points. He concluded from the appearance of these pearls that they were due to tubal peristalsis.

The reason that tubal contractions have not been observed hitherto is briefly summarized by Dyroff as follows: "General anesthesia tends to paralyze muscular movements of the tubes, the same effect being noted on the intestines. Spinal analgesia and local analgesia appear to have the same influence. Tubal contractions are dependent on ovarian activity and vary with the particular phase of the menstruation; therefore, unless special observation is made at favorable times, the motions of the tubes may be overlooked. These motions are slow at best and in women they are slower than in females of the lower animals." To these factors, said to be responsible for the failure to observe peristalsis of the tubes during laparotomy, may be added section of the abdominal wall with exposure of the viscera. This in itself may be an important factor in inhibiting tubal motions. Peripheral nerve blocking, as in local anesthesia of the abdominal wall, may reflexly influence the visceral innervation, but tubal contractions appear not to be entirely dependent on nervous stimulation, as they continue for some time when the extirpated organs are suspended in oxygenated Locke's solution.

Recently, Forestier has advocated the use of lipiodol —an iodized oil—in the roentgen-ray examination of various body cavities. It is extremely radiopaque and is very distinct even when overlapped by bone shadows. It was therefore used as the medium in our study of women with tubal obstruction as previously demonstrated by gas insufflation. Not only were roentgenograms taken of the tubes, but direct fluoroscopic observation enabled us to watch the fluid in the uterus and tubes. It was thus possible to note also whether peristalsis was present. The method would be analogous to the observation of gastro-intestinal movements and peristalsis under the fluoroscopic screen in the presence of roentgenographically opaque solutions.

PRELIMINARY STUDY

For the purpose of our preliminary study, we chose only those patients in whom peruterine tubal insufflation with carbon dioxide gas had demonstrated the fallopian tubes to be nonpatent or partially blocked. Twenty-six patients were observed at the office. Fluoroscopic observations were made during the lipiodol injection, and for several minutes after the uterine cavity and tubal lumina were filled by this fluid. Films were taken at the same time, half an hour later, again the next day and at various periods thereafter for several weeks in order to note how long the lipiodol remained in the tubes or in the peritoneal cavity. With the exception of two cases, 5 cc. of the fluid was sufficient to fill the uterine cavity and the tubes to full length. In two

1. Keye, J. D.: Periodic Variations in Spontaneous Contractions of Uterine Muscle, in Relation to the Oestrus Cycle and Early Pregnancy, Bull. Johns Hopkins Hosp. **34**: 60 (Feb.) 1923.
2. Corner, G. W., and Seckinger, D. L.: Cyclic Variations in the Spontaneous Contractions of the Fallopian Tube of the Macasus Rhesus, Anat. Rec. **26**: 299-302.
3. Seckinger, D. L.: Spontaneous Contractions of the Fallopian Tube of the Domestic Pig with Reference to the Oestrus Cycle, Bull. Johns Hopkins Hosp. **34**: 236-245 (July) 1923.
4. Snyder, F. F., and Corner, G. W.: Observations on the Structure and Function of the Uterine Ciliated Epithelium in the Pig with Reference to Certain Clinical Hypotheses, Am. J. Obst. & Gynec. **3**: 358 (April) 1922.
5. Sun, K. C.: Spontaneous Contractions of the Pregnant Human Uterus, Bull. Johns Hopkins Hosp. **36**: 280 (April) 1925.
6. Lee, F. C.: Preliminary Note on the Physiology of the Uterine Opening of the Fallopian Tube, Proc. Soc. Exper. Biol. & Med. **22**: 335-336, 1925.
7. Hartman, Carl: Observations on the Motility of the Opossum's Genital Tract and Vaginal Plug, Anat. Rec. **27**, May 25.
8. Kok, Rudolph: Arch. f. Geburtsh. u. Gynäk., February, 1926.
9. Von Mikulicz-Radecki, F.: Zentralbl. f. Gynäk. **49**: 2322 (Oct. 17) 1925.
10. Dyroff, Rudolf: Zur Frage der Tubenperistaltik, Zentralbl. f. Gynäk. **49**: 1890 (Aug. 22) 1925.

cases the uterine cavity held more than 5 cc., and the quantity used was double.

The results of the examination in the first two of the twenty-six cases were not clear, but they were useful in indicating points in technic to which special attention had to be paid in subsequent cases. The present report is based on data obtained in the remaining twenty-four cases. Of these, seven were blocked close to the uterine wall. In seventeen cases, one or both tubes were visualized. Fifteen of these showed peristalsis which could actually be watched under the fluoroscope and evidence obtained on the films by the distinct beading which Dyroff described as "pearls."

Roentgenologically it is the lumen of the tube that is visualized. This can be divided into two portions—the first, a fine, hairlike process extending from the uterine cavity a distance varying from 1 to 3 inches

Appearance of lipiodol in the uterine cavity and in both tubes and beading due to peristalsis in the right tube.

(2.5 to 7.6 cm.). Its course is usually downward and outward and is fairly straight. The second portion is tortuous and more or less dilated, corresponding to the ampulla, which varies in length from 1 to 4 inches (2.5 to 10 cm.). The first portion does not show any peristalsis. It can be seen with careful fluoroscopy; it empties and fills, but no rhythmic action can be seen. It is in the second portion, the one corresponding to the ampulla, that motion can best be studied. Three types of motion are encountered: 1. The passage of lipiodol through the tubes as a result of pressure exerted by the injecting syringe transmitted through the uterine cavity into the tubes. This movement is slow, somewhat irregular, and goes from uterus to fimbria. 2. A wormlike twisting or writhing action of the tube. This may be due either to a contraction of longitudinal muscle fibers alone or in conjunction with a movement transmitted from adjacent viscera. 3. A true peristalsis, showing as a distinct beading, which travels in a wavelike motion (similar to gastric peristalsis), starting at the fimbria and progressing toward the uterine cavity. It occurred at a rate, varying in different subjects from approximately five to nine a minute. It could not be seen in all subjects and was seldom seen as soon as the tube showed dilatation. Whether this rate is normal or whether it is a response to a foreign material (lipiodol) in the tube is impossible to state, but it proves that the tube is capable of a rhythmic regular peristalsis extending toward the uterine cavity. The peristaltic waves were counted by the aid of a stop watch with a fluorescent dial and are therefore only approximately exact.

COMMENT

Further study may yield data on normal physiologic tubal contractions similar to those obtained by gastrointestinal roentgenography. For this purpose, however, lipiodol injection in the presence of normally patent tubes would be necessary. Forsdike, Mocquot, Forestier and others who have used it for diagnostic purposes state that it is followed by no untoward sequelae. We have seen no complications arise in the cases in which the tubes were completely blocked. The lipiodol has been either removed by aspiration, or the little that remained in the uterine cavity was found to escape almost immediately after the cannula was removed. In the tubes the lipiodol may remain a fairly long time if the obstruction at any point is complete or only partial. This is especially true when cystic dilatation of the tubes is present. In a few of our cases, the lipiodol was seen lodged in the tubes several months after the injection, but no symptoms referable to its presence were noted.

In those cases, however, in which the lipiodol has escaped into the peritoneal cavity immediately following the injection into the uterus or sometime afterward, it is possible that peritoneal irritation may result. We[11] recall the experience with intra-uterine colloidal silver (collargol) injection in the presence of patent tubes, in which an appreciable amount of peritoneal irritation was seen, and it is not impossible that under similar conditions the same results may follow the injection of lipiodol. In one of our three patients with partially patent tubes, lower abdominal cramps were complained of at least twelve hours after the lipiodol injection. There was no febrile reaction, and the patient was able to appear on the following day for a control roentgen-ray examination. It would be well, therefore, never to inject lipiodol into the uterus without first proving by peruterine carbon dioxide gas insufflation that the fallopian tubes are definitely nonpatent.

261 Central Park West—345 West Eighty-Sixth Street.

11. Rubin, I. C.: X-Ray Diagnosis in Gynecology with the Aid of Intra-Uterine Collargol Injection, Surg. Gynec. Obst., April, 1915, pp. 435-443.

Pernicious Anemia and Syphilis.—It is not rare to find the serologic evidence of syphilitic infection in the presence of pernicious anemia. . . . Whether or not there is any causal relation between the two is always a pertinent but almost unanswerable question. Syphilis may be so protean in its manifestations as to present almost any group of symptoms; and it is particularly stated in the writings on this subject that it may in fact cause an anemia of the pernicious type. When this occurs, however, it is relatively early in the course of the infection and not associated with the late manifestations, such as tabes. It is the experience of this clinic that pernicious anemia associated with late syphilis is not the result of the syphilis, but is a separate disease; and antisyphilitic treatment, even though of some benefit to the undoubted syphilitic changes, has no effect on the anemia.—Stern, L. D., *Ann. Clin. Med.*, June, 1926.

Clinical Notes, Suggestions and New Instruments

ORTHOPEDIC APPLIANCE FOR ANKYLOSIS OF ELBOW JOINT

PATRICK P. GROSSO, M.D., CHICAGO
Passed Assistant Surgeon (R.), U. S. Public Health Service

We are not always in a position to spend patients' money freely for orthopedic appliances; besides, brace makers are not always handy especially for the country practitioner, and

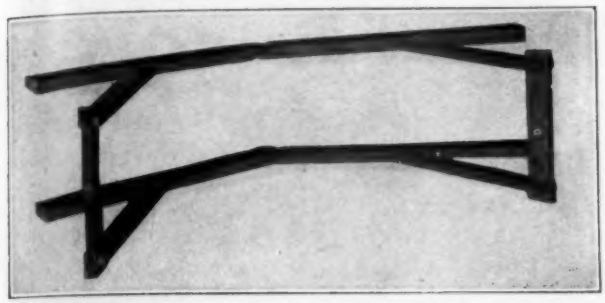


Fig. 1.—Top view.

therefore we are sometimes called on to use a little ingenuity and devise a simple apparatus which can be readily made at home.

The appliance described here pertains to the reduction of incomplete ankylosis of the elbow joint. It is simple to construct, easy to apply, and the results obtained by its use are exceedingly satisfactory.

The principle involved can be used with success in any of the hinged joints. It is that of constant, gradual increasing force in the desired direction. I have used these principles

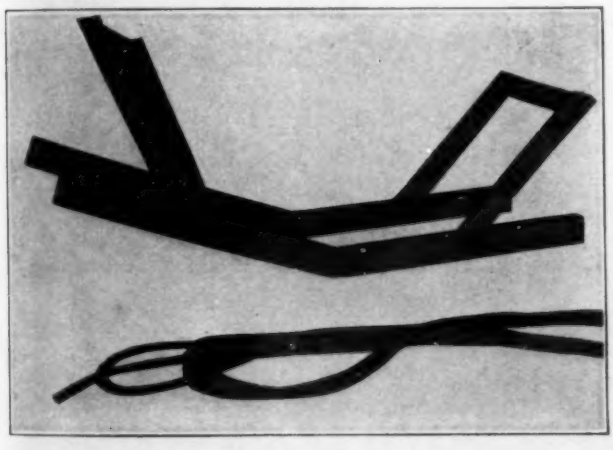


Fig. 2.—Lateral view.

with good results in many cases, even though the hospital had an up-to-date physiotherapy department.

The appliance consists of four rigid pieces of wood about one-fourth inch thick, three-fourths inch wide, and about 8 inches long. One hole is drilled on each piece, 1 inch from the end. The flat surfaces of the ends with the drilled holes are brought together and held in place by means of a machine bolt forming two strips of wood hinged in the center; these correspond to the length of the entire arm and are placed parallel and about one-half inch farther apart than the width of the arm; two rigid upright pieces of wood about 6 inches in length and of the same breadth and width of the other pieces are fastened at an angle of about 30 degrees on the outer surfaces of the strips, in an upright position and about 5 inches from the hinged joints; a cross piece of wood is nailed over the upper ends of the upright to reinforce and serve as handles for the attachment of the rubber elastic tube which will create the constant, gradual tension.

The splint is applied by first putting on two fairly firm well padded plaster-of-paris casts, one on the upper arm to about 1 inch above the elbow joint, and the other on the forearm including the wrist joint and to about 1½ inches below the elbow. The appliance is then placed in position so that the hinges are in line with the center of the articulating surfaces of the elbow, with the hinge jointed pieces of wood parallel, one on the outer side of the arm and the other on the inner side. The appliance is then fastened to the underlying plaster casts by means of several plaster-of-paris bandages, completely incorporating the parallel strips, leaving exposed only the hinged joints and about 2½ inches of the elbow so it can be free to move.

Fig. 3.—Splint in position over plaster cast.

After the plaster has dried about sixteen hours, the elbow is put on tension for flexion by passing about three turns of an elastic rubber tubing, one-fourth inch caliber, around the cross pieces of the uprights; the tension can be increased by pulling taut the rubber tube. The patient is instructed to increase the pull if he can resist more, or loosen it if it is causing discomfort.

Fig. 4.—Splint fastened to underlying cast with plaster bandages.

After the appliance is once put on, all that is required is to loosen the rubber tubing daily for a few minutes and extend the arm—this can also be done by the patient.

The advantageous features are: 1. The appliance is very simple and does not require any mechanical ability or elaborate tools and material to construct. 2. The tension is

constant, and therefore is a time saver because it takes advantage of working day and night with the periods of muscular relaxation and fatigue. 3. The pressure exerted by the tension of the rubber tube is distributed equally over a large area, thereby eliminating pressure sores. 4. The patient will not require a masseur, therefore being relieved from pain as a result of forcible flexion. 5. It takes the place of complicated mechanical devices and gives quicker results.

4141 Clarendon Avenue.

NEW MALE GENITO-URINARY BASIN

WILLIAM W. GOLDNAMER, M.D., OAKLAND, CALIF.

The design and shape of this basin are new; it is especially made to fit the male interthigh position. This is quite important, because this position in a male is a triangle with the base at the knees; in other words, the narrowed pelvis and the relative position of the heads of the femur in a male demand a quite different shape for this kind of basin than were it used for a female.

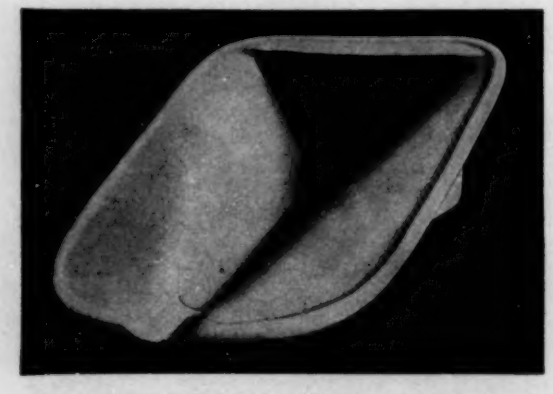


Fig. 1.—Male genito-urinary basin: front and top view.

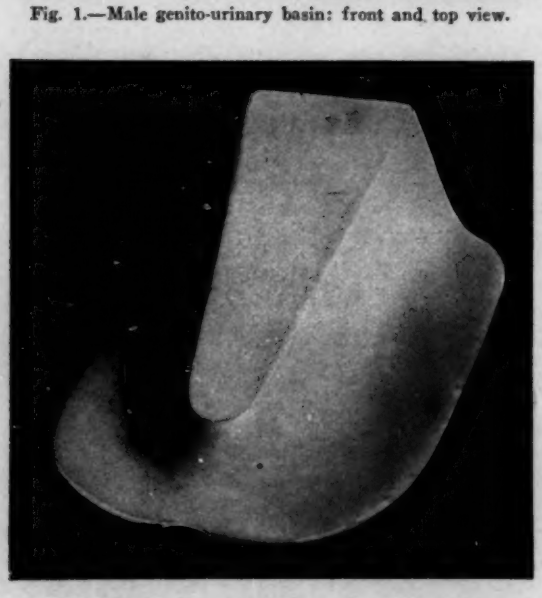


Fig. 2.—Basin as seen from rear and bottom.

Another new point in this basin, and an obvious advantage, is that the splash, at any angle, is toward the floor of the basin.

SALIENT FEATURES OF BASIN

The material is the finest technical porcelain and quite strong, fully glazed and will not stain or discolor. Being 11 by 8½ by 5 inches, it is large and roomy, with a capacity of more than a quart. There are no angles or corners that cannot be cleaned easily.

The weight is 4 pounds, 9½ ounces, about 6 pounds packed; I shall be able to supply these through the regular retail surgical supply houses. The salient points are that it fits the

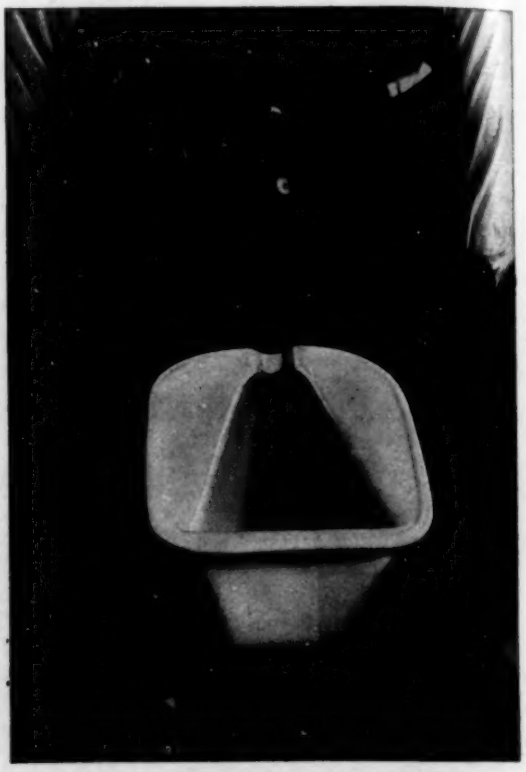


Fig. 3.—Basin as used in sitting position.

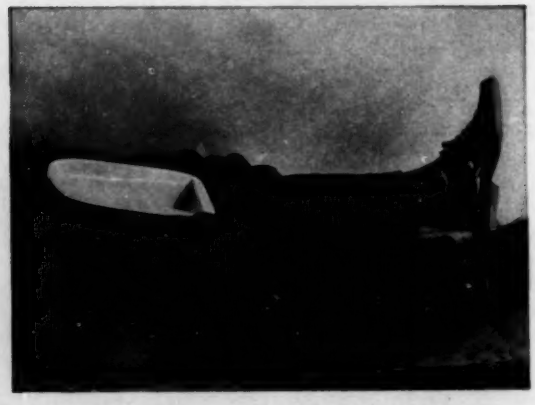


Fig. 4.—Basin as used in recumbent position.

anatomic contours, has a protection for the patient's clothing, and seems practical.

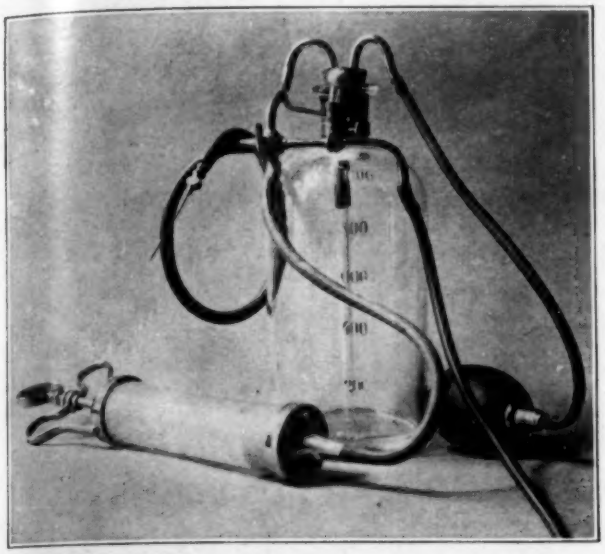
577 Fourteenth Street.

A PRACTICAL APPARATUS FOR ASPIRATING AND WASHING THE PLEURA

A. J. DE MARTINI, M.D., AND ROBERT S. WYNN, M.D., GENOA, ITALY

This apparatus works on the principle of withdrawing the purulent exudate, at the same time introducing into the pleura a mild antiseptic solution, following which air can be substituted. It consists of a graduated bottle containing 1,000 cc., and a cork with two openings into which pass two metal tubes. The right tube is connected to a rubber bulb. The left tube is connected to an especially constructed cock with four openings. The upper opening of the cock connects by a metal tube to the inside of the bottle; the left opening is connected to a pleura needle. The lower opening is connected by a

rubber tube to a 100 cc. glass syringe. The right opening is a metal tube with a two way cock so that when the cock is open, fluid can be forced from the pleura to a receiving vessel outside; or, if the cock is closed, there is a small filter through which air is sucked by a syringe and forced into the pleura.



De Martini apparatus for aspirating and washing the pleura.

This specially constructed cock allows the passage of a simultaneous double current, which is controlled by a handle so that when the handle is turned horizontally, fluid is sucked from the pleura into a syringe. When the handle is turned perpendicularly, fluid is forced from the syringe into a receiving vessel; at the same time, the solution in the bottle is forced into the pleura. This apparatus has been used in cases of empyema to aspirate the pus and wash the pleura until the solution returns clear. Then sufficient air is forced into the pleura to prevent adhesions forming.

A MODIFICATION OF BEER'S SUPRAPUBIC DRAINAGE CUP

JAMES A. GARDNER, M.D., BUFFALO

After suprapubic cystotomy, various methods have been used to take care of drainage. If rubber drainage tubes are used, they will keep the patient more or less dry, but delay the healing. If absorbent pads and cotton are used, they practically form a urine poultice.

Fig. 1.—Cup is made in three sections, the top and body of cup of hard rubber, the flange of soft rubber.

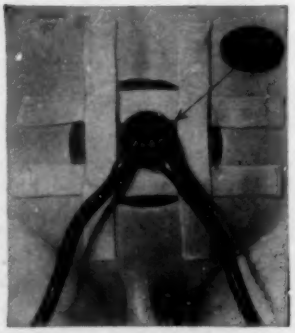


Fig. 2.—Drainage cup in place.

Some years ago, Dr. Edwin Beer brought out a suprapubic cup made of hard rubber, which is attached to the abdomen by an adhesive plaster mass supplied by Johnson & Johnson. This cup seemed to provide a most satisfactory and economic method of caring for the drainage in these cases. It was found, however, that the hard rubber flange of the Beer cup would not fit a certain type of abdomen. The cup has been modified by making the flange or skirt of soft rubber, and the outlets for the drainage tubes have been increased in caliber.

The adhesive mass is soluble in benzine. The evaporation of the benzine in the mixture can be hastened by heating. The mass should be of the consistency of tar when spread on the rubber flange. The cup is now ready to apply over the wound, and is reenforced by strips of adhesive plaster.

The skin should be dry before the cup is applied. This is one of the most important parts of the technic.

If a large catheter is placed in the suprapubic opening, or an indwelling catheter placed in the urethra for four or five hours, so that the adhesive mass has a chance to become thoroughly attached, the cup will keep the patient absolutely dry.

Following a prostatectomy, the cup should not be applied until the drainage is sufficiently clear so that the drainage tubes will not become plugged.

The drainage tubes are placed in a urinal between the patient's legs, or permitted to drain in a bottle when he is out of bed.

These cups may be procured from Charles R. Bard, 79 Madison Avenue, New York.

General Electric Building.

UNUSUAL FOREIGN BODIES IN THE GASTRO-INTESTINAL TRACT

JACOB BUCKSTEIN, M.D., NEW YORK
Consultant in Gastro-Enterology, U. S. Veterans' Bureau; Associate Roentgenologist, Bellevue Hospital

A. M., calling himself "The Count with the Hidden Jewels," by which title he has become known, was accidentally noticed swallowing a tablespoon bent on itself. This led to an

Appearance of abdomen, showing various articles swallowed.

examination of the abdomen, with the result seen in the accompanying illustration.

In the stomach were present a tablespoon bent on itself, a bed spring, several metal door fixtures and a part of a lock. In the ileocecal region, there was a spring of some sort. In the rectosigmoid area was a conglomeration of nondescript articles. At the end of seven days, the latter articles were evacuated. Those in the stomach and illeocecal region remained.

1 West Eighty-Fifth Street.

A PRACTICAL DRAINAGE TUBE FOR CLOSED DRAINAGE IN EMPYEMA

F. W. McGuire, M.D., Buffalo
Assistant Professor of Surgery, University of Buffalo Department of Medicine

Those who are concerned with closed drainage in the treatment of empyema should be interested in this simple, practical and inexpensive drainage tube.

Closed drainage is positively indicated in all cases of empyema in which adhesions have not formed between the parietal and visceral pleura. It is also indicated in those

Fig. 1.—Tubes: 1, 3/8 by 2 inches; 2, 5/16 by 2 inches; 3, 1/4 by 2 inches; 4, 1/4 by 1 inch.

conditions in which the patient is extremely toxic, as this class of patients succumb very readily to even minor operating. It has a further advantage in that it eliminates dressings.

The use of the instrument is very simple. Local anesthesia is produced between the ribs selected. This point should be sufficiently high so as to prevent the tube from coming in contact with the diaphragm. A skin incision is made to allow the introduction of the point of a trocar. The trocar is plunged through the chest wall. The tube is inserted. If the tube touches the lung it should be withdrawn slightly and a rubber collar or gauze placed between the shoulder of the tube and the chest wall. A finger is held over the

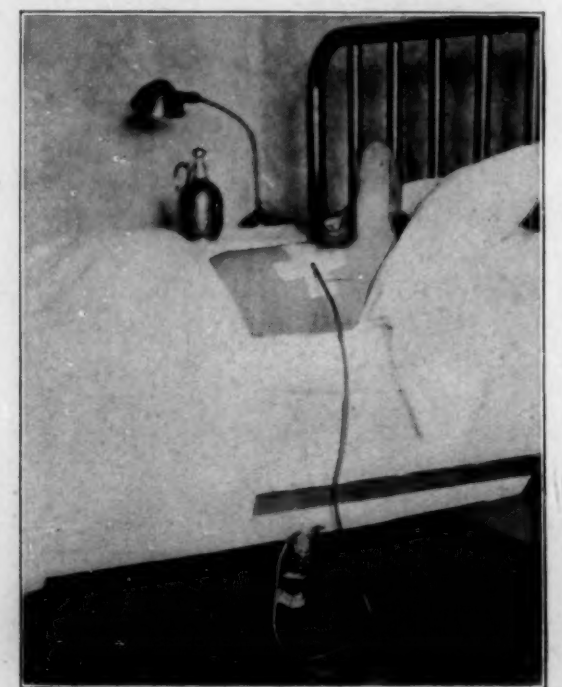


Fig. 2.—Drainage tube in chest.

opening in the tube. A piece of gauze is placed between the shoulder of the tube and the chest wall. The tube is fastened to the chest wall by adhesive plaster. The drainage tube is connected with a rubber tubing as shown in the illustration. This tubing is connected with an air-tight bottle. On the distal glass tube of the bottle there is a one-way valve, to prevent the entrance of air. The tubes are made in different sizes, as any tube put through the chest wall will leak at the end of seven or eight days; a larger tube is then inserted which will prevent leakage for another week. I believe that this method of collecting the pus is better than having it run into water, as the amount of pus that escapes can be measured and its character determined. It is well at this point not to allow a too rapid escape of pus, as a sudden withdrawal of a large amount may have an embarrassing influence on account of its traction on the mediastinum. The patient is left alone for about twenty-four hours, when irrigation with 1:3 surgical solution of chlorinated soda is used at least twice in twenty-four hours. Under this manner of treatment, patients regain their strength quite rapidly; and if the tube is used early enough, a number of these patients will recover without further treatment.

THE JUMP METHOD OR INTERRUPTED TUBE FLAP: A NEW TECHNIC IN FASHIONING TUBE FLAPS FOR SKIN GRAFTS

J. Paul de River, M.D., San Francisco.

In fashioning tube flaps preliminary to transferring large skin grafts from distant regions, the paramount thing to be considered is the securing of a graft that has an abundant blood supply, so that the viability of the transplant may be assured.

A, old method; *B*, new, or jump, method.

This is best accomplished by outlining a large section of skin and then forming a tube by suturing the outer edges together at the under surface, thus leaving the skin surface outward. The tube is allowed to remain attached at the proximal and distal ends until its edges are well united and an adequate blood supply is established. This is accomplished in from ten days to two weeks. When good circulation is evident, the distal end with the graft attached is severed and swung into place, covering the area to be grafted.

This procedure is successful in a large measure, except when there is a scanty blood supply, as in tubes fashioned from the chest and abdomen, and when the length of the tube does not exceed 8 or 10 inches. In taking tubes of a greater length from these regions, the chance of failure increases in proportion to the length and breadth of the tube (*A*, in illustration).

That I may be reasonably assured of the vitality of the tube by giving it a sufficient blood supply, I have modified Gillies'

method. In this way a more abundant blood supply is furnished the tube, and at the same time immobilizes it. This is of great importance in dealing with long tubes, because twisting throws tension on the proximal and distal ends and may result in the loss of the entire tube by necrosis. To overcome this I not only allow the proximal and distal ends to remain attached, but I use what I term "the jump method or interrupted tube flap" (*B*), which is as follows:

Two parallel incisions are made through the skin, superficial fascia and deep fascia, as in the ordinary tubing method, and carried for 3½ inches (9 cm.). Then there is a jump of one-fourth inch (5 mm.). The incision is continued for another 3½ inches and followed by another jump of a quarter of an inch. This method enables one to prepare tubes of indefinite length with a reasonable certainty of safety because of the nourishment furnished the tube from its lateral attachments as well as the proximal and distal ends. These lateral attachments also serve to hold the tube in place without the use of pressure dressings, and prevent their twisting. At the desired time the small laterally attached areas are cut and sutured with fine catgut. The proximal or distal end is detached and transferred to its new position.

369 Flood Building.

RECIPE FOR EPILATING WAX

WILLIAM ALLEN PUSEY, M.D., CHICAGO

Epilation by means of an epilating wax is in many cases as satisfactory a way as any of handling cosmetically objectionable hairs. These epilating waxes are made usually of beeswax and rosin. They are commercially obtainable, but at high price. Because of the price to patients, I suggested to my assistant Dr. Theodore Cornbleet that he experiment with various mixtures until he got a satisfactory wax.

A wax which is efficient for epilation, and which is in every way as satisfactory as commercial waxes, can be made of beeswax, one part by weight, and finely powdered rosin, four parts by weight. The wax is melted over a low fire and, after melting is complete, the powdered rosin is poured in. The heat is continued and the mass stirred gently until entirely melted; this requires from one to two minutes.

For use it then needs to be molded. It is the consistency of home-made candy and can be handled in the same way. One way is to pour it into a deep dish and then crisscross it with deep markings about three-fourths inch apart as though one were making caramels. The plate must be greased, say, with petrolatum, to prevent the wax sticking to it. After it is cooled the wax is fairly brittle and the blocks can be broken off for use. It can also readily be molded in sticks by taking heavy paper and making a hollow tube about five-eighths inch in diameter and 3 inches long, one end of which is closed off by being folded in. After the melted mixture has been poured, the tube is allowed to stand until the mass hardens. This takes only a few minutes. Heavy wax paper is the best for this purpose, but any wrapping paper can be used, provided it is greased on the inside to prevent sticking. Wax, 2 drachms (7.5 cc.) and rosin, 1 ounce (30 Gm.) make a workable stick; about two or three times as much should be used for making square blocks.

The method of removing hairs with the wax is as follows: A block, or the end of the stick, is melted by heating over a flame until it becomes soft; this can be done with a temperature that will not burn the skin. When softened, the melted wax is rubbed on the skin in the direction of the hair growth. It is well to press it down with the moistened end of the thumb, until one gets a layer about one-eighth inch thick. This is allowed to cool, or is chilled by the application of ice or cool water. After it is cooled, the edge of the wax is picked up with the nail and the wax pulled off with a quick pull in the opposite direction to the growth of the hairs. This is only slightly uncomfortable. If the application has been well made—and it is easy to learn to do this—few hairs will remain on the surface. Those that do remain had best be left for subsequent application, or removal with epilating forceps. The fragments of wax that stick to the skin can be picked off or easily dissolved with carbon tetrachloride.

My impression is that the temporary removal of superfluous hairs with an epilating wax is the most practical way of handling many cases. The prolonged, careful experiments of Trotter[1] would seem to indicate that the temporary removal of hairs, no matter what the method, has no effect in stimulating their growth. Schwenter-Trachler[2] of Berne believes that the removal of hairs by abrasives, such as pumice, makes the growth less vigorous. I am not able to see the validity of the grounds for this belief, but there seem grounds for hoping that the mechanical epilation of the entire hairs may have some effect in interfering with growth. The mechanical removal causes some traumatism of the hair follicle which must be followed by slight inflammatory reaction. It is possible that the prolonged repetition of this inflammatory reaction might, in time, produce sufficient sclerosis around the follicles to cause shrinking of them. Certainly, I see no reason to believe that there is any objection to the temporary epilation of superfluous hairs.

7 West Madison Street.

SPONTANEOUS RUPTURE OF THE EXTENSOR POLLICIS LONGUS

C. K. BARNES, M.D., CHICAGO

This case is being reported because only two other cases have been reported in the last ten years.

REPORT OF CASE

In January, 1926, C. D., a man, aged 35, while carrying a board, suddenly noticed that he could not move his left thumb, although he did not feel pain.

On the same day, when he entered the Auburn Park Hospital, pain, tenderness and evidence of injury to the hand or wrist were absent. The patient was given instructions to bathe the hand in warm water and to return the following day.

My examination the following morning revealed that the patient could not extend the thumb. Flexion was normal. There was neither pain, tenderness nor anesthesia. After some manipulation I was able to push the distal end of the tendon of the extensor pollicis longus down into the lower part of the tendon sheath, and the diagnosis of a ruptured extensor tendon was established.

Under local anesthesia, the unevenly torn ends of the tendon were sutured with silk, and the tendon sheath closed. The thumb was splinted for five days, after which passive motion and massage were employed. The patient returned to work in six weeks, without loss of function of the thumb.

COMMENT

Except for the rupture the tendon had appeared normal. Whether or not the zero temperature at the time favored its rupture, I am at a loss to know.

Auburn Park Hospital.

1. Trotter, Mildred: The Resistance of Hair to Certain Supposed Growth Stimulants, Arch. Dermat. & Syph. **7**: 93 (Jan.) 1923.
2. Schwenter-Trachler: Arch. f. Dermat. u. Syph. **111**: 69, 1912.

Spartan Life Not for the Individual.—On the whole, he taught his citizens to think nothing more disagreeable than to live by (or for) themselves. Like bees, they acted with one impulse for the public good, and always assembled about their prince. They were possessed with a thirst of honor, an enthusiasm bordering on insanity, and had not a wish but for their country. These sentiments are confirmed by some of their aphorisms. When Paedaretus lost his election for one of the three hundred, he went away rejoicing that there were three hundred better men than himself found in the city. Pisistratidas, going, with some others, ambassador to the king of Persia's lieutenants, was asked whether they came with a public commission, or on their own account, to which he answered, "If successful, for the public; if unsuccessful, for ourselves."—Monroe: Source Book of the History of Education, p. 22.

Special Articles

HEREDITY OF DISEASE*

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In discussing so extensive and somewhat vague a topic as heredity of disease it is necessary, first of all, to define terms. It is obvious, in view of the diversity of attitude of medical men toward heredity, that there is a corresponding diversity of connotations connected with the word. In the present article, I will use heredity as covering the internal factors that direct development. This is not to say that there are any internal factors which, alone of themselves, determine the course of development but that internal factors play a very important rôle, such that through them are determined the specific form and most of the details of development, given an adequate and appropriate environment in which the development can take place.

The end-result of development is the reaction between the internal factors and the external factors. The internal factors may be called the genotype and the end-result may be spoken of as the phenotype. The phenotypical characters are determined both by genotypical impulses and by environmental, or paratypical, conditions. It is often difficult to say how much of the phenotypical result is due to the internal genotypical and the external, paratypical, influences.

Disease may be considered as any deviation from normal in development, in form or in functioning of the phenotype.

In considering heredity of disease, the biologist may properly insist on the universality of the broad principles of heredity and of disease in all organisms. It helps, in considering the topic "heredity in relation to disease," to take the broadest possible view over the field of organisms. This comparative view will help us to distinguish between the essentials and the incidentals of the phenomenon.

It is clear that the course of development is tremendously influenced by internal factors. Otherwise we should not have the egg of a starfish and the egg of a sea urchin, lying in the same finger bowl, develop in entirely different directions, after the first cleavage steps have been passed through. In one and the same species the course of development is not always the same. In man we have in different parts of the earth, and even in the same great city, negroes who develop long appendages, and Chinese who develop short appendages; persons with wooly hair and those with straight; persons with high, narrow noses and those with low, flat noses; persons with long heads, and those with short. A textbook of embryology which goes into detail would not be equally applicable to the negro race and the white race because the course of development is different in these races, even though the respresentatives of them whose development we are considering may be brought up under environmental conditions as alike as possible. We find, indeed, that even in the white or European race there are developmental differences in different strains, as, for instance, the short-legged Mediterraneans and the long-legged Scotch, the heavily pigmented Italians and the slightly pigmented Scandinavians. For parents who both belong to the pure south Italian strain it is as much of an abnormality to have a blue-eyed child as for typical Swedes to have a black-eyed child. A condition that is normal for one race may be abnormal for another race, depending on the internal or hereditary impulses of the race.

Different internal developmental impulses may be found, indeed, in different members of the same family, so that some of the children may be short while others are tall, some slender while others are obese, some blue-eyed while others are brown-eyed. This difference in developmental impulses is different in the germ cells of the parents who are themselves of hybrid origin.

While variations in pigmentation, in form and in size are so common in our population that we hardly think of the variations as abnormal, there are, on the other hand, extreme conditions that we speak of as abnormal, although their development is determined by the same sort of laws as those that control the development of the more normal variants. For example, we have strains of persons in whom the brown pigment is entirely lacking, called albinos. In them the impulse to the production of brown pigment is as much weaker than in the typical Swede as in the typical Swede it is weaker than in the Mediterranean. The method of inheritance of albinism is very simple; namely, there is a genotypical lack of the enzyme that produces brown pigment. If this is genotypically absent in both parents, it will be absent, phenotypically, in their children and also in the germ cells of the child. In just the same way two of the blondes of Sweden lack gens in their germ cells for the deeper grades of pigmentation, so that their children show, phenotypically, none of these deeper grades.

The hand, as is well known, generally has five fingers. However, there are certain communities in which a sixth finger is so common as scarcely to cause remark. The irregularity in the formation of fingers is due to a peculiarity of the developmental process which we may infer follows from the presence of a factor that gets in the way of the establishment of the five crenulations on the free margin of the embryonic flipper. Instead of that the flipper hesitates in laying down the crenulations that are the beginnings of the fingers, and when these are finally started they are formed late and vary in position, number and degree of development. This disturbance of development in the margin of the embryonic flipper is a genotypical condition which is not only in the gametes of the parents of a polydactyl or a syndactyl individual but is also in the germ cells of such children, so that when those germ cells in turn participate in producing a zygote, the zygote will develop abnormally when it comes to the production of fingers. We speak of inheritance of these finger abnormalities as a dominant trait. The dominance depends on the presence in the germ plasm of this disturber of development.

And so we might go on, referring to a number of other peculiarities that we denominate abnormalities of development. In certain persons the bilateral elements of the palate fail to come together, so that a cleft remains between them. There is no doubt about the genotypical basis of the phenomenon of harelip and cleft palate, but it is impossible to predict, with precision, in regard to the distribution of these traits in a family of children because the internal factors which shape the form of the head are so numerous and vigorous, as compared with that one condition which tends to prevent the formation of the palate that they frequently overcome this defect, so that a person who

* From the Carnegie Institution of Washington.

carries the tendency genotypically may actually not show it. I am not unaware that there are those who would maintain that harelip and cleft palate are due to an infection of the embryo by the poisons of syphilis, alcohol or some such other agent. Certainly I would not maintain that such poisons are not capable of producing this abnormality; but, as a general explanation of harelip and cleft palate, the theory is entirely inadequate for the reason that we have these defects developed with great certainty and regularity in certain strains of dogs, especially the Boston terriers. Again, the muscular control of the eyelid may be imperfectly developed, so that a congenital droop of the eyelid appears in many of the children of a family in which this developmental peculiarity is represented in the germ plasm. This germinal representative, again may be handed down from generation to generation without skipping any, as a typical dominant trait. There is, indeed, hardly one of the developmental processes of the body that may not proceed abnormally through some genotypical peculiarity. There is hardly an organ of the body whose development may not go astray; and the genotypical factor in these cases shows itself through repeated abnormal development in members of the same family.

Thus, the development of the nervous system may be abnormal. This is seen in an extreme case in amaurotic family idiocy, in which especially the sensory nerves seem early to fall behind in development. It is seen in the typical feebleminded infants in whom a factor for full cerebral development seems to be missing, so that the cerebrum lags behind in its ontogeny. If the impulse to full cerebral development is absent in the germ cells from both sides of the house, it seems to be absent in all the children also. Again, the bones may be improperly formed, so that the haversian systems are more or less completely absent. Such persons from infancy break their bones on slight provocation, and this condition tends to recur in successive generations. It is a so-called dominant trait. Again, the muscles may early lag behind in development, so that a dystrophia appears and the tendency to this muscular dystrophia has an hereditary basis, as is shown by its repeated occurrence in successive generations.

The genotypical failures of bone development show themselves strikingly in the failure of separation of the two bones, radius and ulna, which are made out of the cartilaginous plate that precedes them in development. Thus there are produced families characterized by the so-called radio-ulnar synostosis.

The constitution of the retina may be developed so abnormally that ability to distinguish colors shall be absent. This particular abnormality is of great interest, since the gen that is responsible for it has been located in the sex chromosome, a matter to which reference will be made a little farther on. In other persons the structure of the ear may be such that discrimination of variations in pitch is feeble or absent.

In the formation of the blood, the chemical elements responsible for coagulation may be absent or feeble in degree, so that the phenomenon of hemophilia appears. This defect, like that of color blindness and family optic atrophy, is located in the sex chromosome.

The number of organs that may be affected in some degree by imperfect or inadequate developmental impulses is very great. A catalogue of them would be unsuitable for a brief article.

Heredity shows itself also in variations in susceptibility or resistance to disease. Resistance or susceptibility are due to morphologic or chemical idiosyncrasies of the organisms, and such idiosyncrasies are widespread among plants and animals. Those who live in the eastern United States have recently seen the rapid elimination of the American chestnut through its inability to resist the growth of a particular fungus on its bark. This fungus, *Endothia parasitica,* was imported to this country from the Orient. The chestnut that lives there resists the disease, and the resistance may be imparted to the American chestnut through the union of its germ cells with those of the Asiatic, and the subsequent purification of undesired characters from the hybrid.

In the same way, wilt attacks watermelons and will cause the death of from 99 to 100 per cent of the individuals in a field. There are other related but inedible melons which resist this wilt, and the ability to resist has been transmitted through hybridization to the edible forms. There are certain strains of mice in which tumors grow with great rapidity, causing death. The cells of such a tumor taken from one individual to another of the same strain will cause another rapidly growing tumor there, but there are certain strains of mice that are well known to be so resistant to tumors that when the tumor cells have been inoculated in them the tumor cannot grow. The widespread occurrence of cancer in our population is due, in part, to the widespread existence of a chemical susceptibility whose dissemination has been brought about by matings and permitted to spread through the whole population, owing to the fact that cancer does not eliminate before the reproductive period.

Splenetic fever is the cause of death of vast numbers of European cattle in Texas. It has been demonstrated that the germ of the fever is disseminated by a tick; but the American bison and the zebu of India are immune to this disease and can transmit that immunity, with certain morphologic traits of form of the whole animal, to their offspring. We may not be surprised to find, therefore, that different strains of human beings react differently to inoculation with yellow fever and the germs of other insect-carried diseases.

The inheritance in disease is shown in a difference in general resistance. Thus, the late Alexander Graham Bell demonstrated the inheritance of a general resistance that lies at the bottom of great longevity. In certain families one can predict that, barring mechanical accidents, the members will probably live to the age of 80 or 90 years.

General and special resistance are no doubt due to idiosyncrasies in chemical constitution. How profoundly chemical constitution differs in different individuals is shown by the differences between different blood groups in respect to agglutination. We are not surprised to find strains of persons that are resistant to tuberculosis, that are resistant to tumors, that are tolerant of sugar, that show little fatigue, whose endocrine glands have idiosyncrasies of overactivity or underactivity.

It was formerly thought that it was sufficient to disprove the rôle of heredity to show that a particular disease, such as tuberculosis, is dependent, for instance, on *Bacillus tuberculosis.* This bacillus is obviously only one element of the disease of tuberculosis; the other element is a susceptible organism. The importance of susceptibility is shown by the statistical studies of tuberculosis, which demonstrate that husband and wife, living together with every opportunity for mutual infection, are less liable to show an active tuberculosis than

father and children, who are more apt to have the same chemical constitution.

Even abnormal behavior can be shown to have a genotypical basis. The feeble inhibitions that give the characteristic picture of the tendency to violent outbreaks of temper or maniacal behavior can be shown to be inherited as a dominant trait, though the immediate agent may be some idiosyncrasy in the secretions of endocrine glands.

The importance of constitution in determining disease has, indeed, gained widespread recognition in the last few years. Constitution is determined, to be sure, only in part by the genotype. A genotypically resistant individual may, paratypically, lose this resistance, so that he becomes a victim of disease; but every profound student of constitution has to recognize the important part played by the germ plasm and the chemical idiosyncrasies that it establishes in the body.

From this point of view, constitution and heredity are not esoteric matters and they are, certainly, matters whose importance cannot be diminished by the vehement denials of the ignorant. Their importance has to be recognized and seized; and if the phenotype shows traits that are not desirable, an attempt must be made, through paratypical influences, to improve, if possible, the unfortunate conditions. That an unfortunate constitution may be established through inheritance is no reason for denouncing heredity and those who call attention to its importance. The fact rather challenges the profession to study in detail the inherited basis of defects and disease and to be in a position to advise in regard to marriage matings which may be unfortunate from the standpoint of offspring.

No discussion of heredity is adequate that does not refer to the new and incontrovertible evidence that it depends on the cell structures called chromosomes—the bodies in the cell nucleus which take the microscopic dyes deeply.

In the last two decades it has become established that their number is, in general, constant for a given species (with exceptions to be spoken of in a moment). In man there are twenty-four pairs, and of each pair one constituent has been derived from the ovum, the other from the sperm cell, the two cells that come together to form the zygote, or fertilized egg. Not only is the number of chromosomes constant, but they often have individual differences, so that one who is familiar with them can identify particular chromosomes. Indeed, a friend of mine, who is one of the very best of chromosomatologists, calls those he recognizes under the microscope by name, as Mary, Bessie or Jennie. There is no doubt of the individuality of the chromosomes.

The evidence that the chromosomes play a leading part in the internal control of development is, as stated above, overwhelming and incontrovertible. This evidence falls into two great classes: first, the evidence from the architecture of the chromosomes, and, second, from the results of variation in the number of chromosomes in the total chromosomal complex of the species.

Evidence from the architecture of the chromosomes was first gained when it was found that certain characteristics are linked in heredity. That is to say, if two linked characters are found together in one parent and are not represented in the other, the linked pair will tend to recur together in successive generations of offspring. Building on this fact and making use of the rapidly multiplying fruit fly *Drosophila melanogaster*, Morgan and his associates investigated linkage and discovered that the number of linkage groups in this species is the same as the number of pairs of chromosomes; that is, there are three large linkage groups corresponding to three large chromosome pairs, and one very small linkage group which is believed to correspond with a minute chromosome.

It was found, however, that in two linked characters occasionally the link was broken, so that a crossing over occurred by which some of the offspring had only one of the usually linked pair and others the other. It was found that the proportion of individuals showing this crossing over was variable for different traits, and, as a result of thousands of matings, the conclusion was strengthened that the greater the amount of crossing over of two traits, the greater the distance between the gens that are responsible for these traits in the chromosome. By working along this line, a chromosome map eventually became possible, indicating the relative position along the axis of the chromosome of the gens responsible for special traits of the fly. In some cases as many as thirty gens have thus been located in one chromosome. Thus, there has been given to each chromosome in *Drosophila* a definite architecture.

In other species, also, linkage has been found, not only of flies but of other insects, of plants and even of mammals. Thus it appears that linkage is a general phenomenon.

Any one who reads the literature of the breeding of *Drosophila*, of maize and of small mammals must be convinced of the truth of the theory that the chromosomes are made up largely of packets of enzymes that are respectively primarily responsible for the development of specific characters of the adult.

The other line of evidence as to the rôle of chromosomes in heredity is not less convincing. This investigation has been developed to a high degree by Drs. A. F. Blakeslee and John Belling, working with jimson weed, *Datura stramonium*. In this species there are twelve pairs of chromosomes, which differ from one another so that they can be distinguished as A, B, C, etc. Now it sometimes happens, through an irregularity in cell division, that an individual receives three chromosomes in place of the ordinary two in the A set. In this case the plant can be readily distinguished, as it grows in the field, through the possession of a number of bodily peculiarities. Again, the extra chromosome may be in the B set or in the C set or in any of the twelve, and in each case the peculiarities of the resulting plant are such that it can be readily told in the field. There may even be two extra chromosomes to each of the sets, although not all of the combinations are viable, or the whole chromosome complex may be doubled, making four to a set. Such a tetraploid is like the normal form but much more vigorous. Finally, by crossing a tetraploid and a normal diploid, a triploid condition may be produced in which the chromosomes appear in sets of three. This plant is distinguished, above all, by the great variability of its offspring. Finally, it is possible to secure a plant that has only one chromosome of each set; but this ordinarily does not set seed.

The relation between chromosome number and form is such that the breeder of *Datura* who is familiar with his stock can detect a new variant in the field and predict the corresponding chromosome aberration which must be responsible for it. The cytologist in the laboratory then examines the cells and can report on the condition of the chromosomes in them. And this frequently is found to coincide exactly with the con-

clusion reached (all unknown to the cytologist) by the breeder who examines the plants in the field.

Very little has been done in man on the relation between chromosomes and traits. This is because of the large number of chromosomes (twenty-four pairs) that there is in human beings and because insufficient study has been applied to the heredity of human traits. However, there is one case of linkage of traits that is well known in man. To explain this matter it is necessary to call attention again to the sex chromosome. In many species of animals and in a few plants it has been shown that one of the pairs of chromosomes is frequently peculiar in that the elements of the pair may be unlike in form and may behave in erratic fashion during cell division. This pair is known as the sex chromosome. In the female of mammals and flies, the chromosomes of the sex pair are alike in the female and unlike in the male. This chromosome is sometimes called the X chromosome, and the female is sometimes said to have this in the condition of XX, whereas in the male it is in the condition of XY. In *Drosophila* at least the Y chromosome seems to be without function; but in lower vertebrates and even in man, one or more traits have come to be associated with the Y chromosome.

The traits dependent on the X chromosome are sex linked. In human beings such sex-linked characters are color blindness, hemophilia, optic nerve atrophy and a few others less well determined. The existence of this linkage in human beings is shown by crisscross inheritance in that an affected father will have no affected children, and descendants of his sons will not show the defect. However, half of the sons of the daughters will show the defect and half of the daughters of the daughters will carry the defect, though they do not show it, and it will reappear in turn in their sons.

It thus appears that in inheritance of our traits and, among others, in inheritance of those somatic conditions which permit the development of disease, we are to a large extent what our chromosomes make us.

Apparently opposed to this conclusion there is a series of facts showing the vast importance of the endocrine glands in determining the peculiarities of form. Thus, cretins of different nationality resemble one another closely, and the same is true of the idiot type known as mongoloids. In the case of cretins certainly and in the case of mongoloids probably, the defect is due to an abnormal secretion of the endocrine glands. Indeed, as is well known, Arthur Keith believes that racial differences are largely due to peculiarities in the endocrine secretion, and he would, no doubt, urge that we are what our endocrine glands make us.

To harmonize these conflicting conclusions, we must recognize that endocrine glands themselves are developed under the control of the chromosomes; and so it seems to follow immediately that the quality of the endocrine glands is in part determined by the quality of the chromosomes. Not all children in the valleys of Switzerland where cretins are most abundant become cretins. The tendency is more marked in some families than in others, and so with goiter and other defects of the thyroid gland. The familiar nature of these defects of the thyroid gland indicate that its quality, in turn, depends on the chromosomes.

Studies that have been made on the relation of chromosomes to heredity point the way to future researches in the heredity of man. With the aid of discoveries that have been made in the lower animals and plants on mendelian inheritance and chromosomal dependence of development, we are in a position to investigate the genetic basis of human traits and human diseases. It is a reproach to science, in a way, that studies in this field have been so long neglected. The reason for this neglect is, however, clear—it is the great expense involved in making these studies on human beings where control of matings is impossible. The method of study, under these limitations, is clear. One must go to the families in which the traits that we are studying are found and see of what kind are the matings that have brought them out. This study involves much travel on the part of many collaborators and careful analysis of the results. On account of the practical nature of the results which are certain to flow from such investigation, it should be carried out even though the cost of the research will be considerable. Man suffers incalculable loss through ignorance of the method of inheritance of these traits, which mean so much to the health and welfare of the people in this and other countries.

THE TECHNIC OF MEDICATION

A SERIES OF ARTICLES ON THE METHODS OF PRESCRIBING AND PREPARING, THE INDICATIONS FOR, AND THE USES OF VARIOUS MEDICAMENTS *

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(Continued from page 564)

INTRAPERITONEAL INJECTION

Intraperitoneal injection or infusion is likely to be of importance in small children in whom intravenous injection is difficult or impossible on account of the smallness of the veins and the restlessness of the patient, especially in those too old for sinus puncture, the fontanel having closed.

Intraperitoneal infusion of fluid has become within the last few years a method of great practical importance for such children, who vomit obstinately and are in danger of dehydration and acidosis, unless fluid and carbohydrate are promptly supplied. Enemas may not be retained. Hypodermoclysis is strongly resented by the little ones because it leaves the place of injection somewhat sore.

Technic.—The skin of the abdomen having been sterilized with tincture of iodine and alcohol, the needle is introduced in an upward direction through the abdominal wall in the median line just below the umbilicus. To avoid piercing a distended bladder, the additional precaution should be taken to have the bladder emptied just before resorting to the puncture. With the sudden cessation of resistance which indicates that the needle has passed into the peritoneal cavity, the solution is introduced. Warm physiologic sodium chloride solution may be infused in quantities of from 100 to 250 cc. in small children and from 300 to 400 cc. in older children. This may be repeated every twelve hours.[168]

Though there is practically no danger of puncturing the normal intestine, to be absolutely safe, Weinberg [169]

* This is the thirty-fifth of a series of articles on "The Technic of Medication." When completed, the articles will be assembled in book form.

168. Aikman, John: Parenteral Administration of Fluids, J. A. M. A. 74: 244 (Jan. 24) 1920.

169. Weinberg, M.: München. med. Wchnschr., 1920, p. 1264.

suggests placing a small cut through the skin by means of the scalpel and then introducing and forcing a completely dull needle in a rotary manner through the abdominal wall. He recommends, as the best place for puncture, the juncture of the outer and middle thirds of a line connecting the navel with the anterior superior iliac spine.

Danger of infection seems to be chiefly present in small infants in extremely poor nutritional condition; on account of this, Backes,[170] who reports a few cases of peritonitis in such children for which he holds the infusion responsible, has abandoned it in the presence of very severe nutritional disturbance; but he finds the method favorable for older children, who do not seem to be nearly as liable to infection resulting from this procedure.

Quite a number of clinicians report good, prompt and striking results not only from physiologic sodium chloride solution but also from 6 per cent dextrose solution, and from 2 to 3 per cent sodium bicarbonate, though there are some who believe that the latter causes more abdominal distention than the saline solution.

That absorption of substances in solution is good after intraperitoneal infusion is shown by Dandy and Rowntree,[171] who report that phenolsulphonphthalein is found in the blood in from two to four minutes, in the urine in from four to six minutes, and in the lymph of the thoracic duct in from twenty to sixty minutes. This indicates that the absorption of soluble materials is by way of the blood stream rather than the lymphatics. Corpuscular bodies, on the other hand, such as red blood cells, are absorbed chiefly through the thoracic duct, and much more slowly.

Zeigler[172] found, by experiments on animals, that the absorption of various drugs from the peritoneum is more gradual than from intravenous injection, but also more lasting. This was true for epinephrine as well as for glyceryl trinitrate. Magnesium sulphate or chloride caused motor and sensory paralysis, just as it does on intravenous injection.

That irritant substances, such as neo-arsphenamine, produce a transient aseptic peritonitis was shown by Rosenberg,[173] who, experimenting on rabbits, found a mild inflammatory reaction with desquamation of cells and the formation of an exudate; nevertheless, absorption was complete in twenty-four hours. There was no evidence of permanent injury to peritoneum or viscera, complete recovery having apparently occurred within twelve days. He believes that intraperitoneal injection is therefore perfectly justifiable. The drug should be dissolved in sterile distilled water rather than in salt solution. Small quantities of concentrated solution seem better borne than large quantities of dilute solution.

That the injection of fixed oil into the peritoneal cavity is harmless has been shown by Schwartze[174] by means of animal experiment. Its absorption, however, is very slow. He found oil still present from one to six months after its intraperitoneal injection. The interesting fact has been brought out by such experiments that a dissolved nonvolatile body like sudan III can be absorbed independently of the oil. The fact that the peritoneum and the subperitoneal fat were found stained suggests the possibility of topical intraperitoneal chemotherapy. He concludes that "the usefulness as a pharmacological method of the intraperitoneal injection of fixed oil as a solvent for fat soluble substances would seem to be limited if the entrance of the dissolved material into the circulation is dependent on the relatively rapid absorption of the solvent oil. This, however, does not imply that its use for administering volatile, serum-soluble and even suspended material might not be advantageous."

170. Backes: München. med. Wchnschr. **68**: 1032 (Aug. 26) 1921.
171. Dandy and Rowntree: Ann. Surg. **59**: 4, 1914.
172. Zeigler, W. H.: The Intraperitoneal Injection of Certain Drugs, J. Am. Pharm. A. **14**: 86 (Feb.) 1925.
173. Rosenberg, William: The Intraperitoneal Administration of Neo-Arsphenamine, J. A. M. A. **82**: 682 (March 1) 1924.
174. Schwartze, E. W.: Some Observations on the Behavior of a Fixed Oil (Peanut Oil) Injected Intraperitoneally, J. Pharmacol. & Exper. Therap. **17**: 115 (March) 1921.

INTRAPERITONEAL BLOOD TRANSFUSION

It having been shown by a number of observers experimentally as well as clinically that intact red blood corpuscles may be promptly absorbed from the peritoneal cavity, provided compatible blood is used and provided the patient is not in an extremely poor condition, we may actually speak of intraperitoneal blood transfusion, which may be of life-saving importance in infants and young children with veins so small as to be inaccessible and in whom injection into the superior longitudinal sinus is impossible or undesirable. A special advantage of this administration route lies in the fact that one would not hesitate to inject in this manner small quantities (from 20 to 30 cc.) repeatedly, so as to avoid overloading the circulation, when it is much enfeebled. This can be done by the use of defibrinated blood, which Hans Opitz[175] has used in two cases of severe anemia of infants with very satisfactory results, even though the blood was 1 and 2 hours old. Opitz emphasizes the fact that typing to avoid agglutination or hemolysis is as necessary here as in intraveneous infusion. He does not feel certain about the clinical admissibility of citrated blood.

Siperstein and Sansby[176] report satisfactory experiments on rabbits, and Siperstein[177] cites five cases, with favorable results in three from intraperitoneal injection of citrated blood. They find this method simple, practical and efficient.

Ruh and McClelland[178] have experimented on guinea-pigs and dogs, with defibrinated, citrated and whole blood. They find that the injection of whole blood, which is the most simple, gives no more reaction than modified blood, and is therefore to be preferred. They have obtained encouraging results in the few cases in which they had the opportunity to use it, and believe that this form of transfusion could be made a valuable clinical procedure in selected cases of sick infants, not only for hemorrhagic disease of the new-born and anemia, but also in many other conditions, such as prematurity, athrepsia, acidosis, and extraordinarily exhausting diseases.

SUBARACHNOID INJECTION

The term "subdural" injection is obviously not as correct from the standpoint of anatomy as is "subarachnoid." The adjective "intrathecal," also applied to this injection, though shorter, is unfortunately not as distinctive, because "theca" also means a tendon sheath. These three terms may, however, be considered synonymous and to mean the introduction of material into the cerebrospinal fluid or the space occupied by it. This fluid is normally as clear and colorless as water, has a low specific gravity (from 1.006 to 1.007), contains

175. Opitz, Hans: Intraperitoneale Blutzufuhr als Substitutionstherapie bei kindlichen Anämien, Klin. Wchnschr. **3**: 784 (April 29) 1924.
176. Siperstein, D. M., and Sansby, J. M.: Intraperitoneal Transfusion with Citrated Blood, Am. J. Dis. Child. **25**: 107 (Feb.) 1923.
177. Siperstein, D. M.: Intraperitoneal Transfusion with Citrated Blood, Am. J. Dis. Child. **25**: 202 (March) 1923.
178. Ruh, H. O., and McClelland, J. E.: Intraperitoneal Transfusion in Infants, Ohio State M. J. **19**: 780 (Nov.) 1923.

but little protein (from 0.2 to 0.5 per cent), and is very poor in cells. That it has an important mechanical function, serving as a water cushion to the central nervous system, is shown by the fact that any marked change in its pressure relations is accompanied by even serious disturbance in functions. Rise in pressure is responsible for some of the signs and symptoms of meningitis, meningismus and hydrocephalus, as is demonstrated by the striking improvement that follows the mere lowering of pressure by means of puncture. Insufficient pressure is probably the main cause of the so-called puncture headache.[179] It usually begins the day following the puncture, but may come on earlier or later, and be accompanied by nausea, vomiting, dizziness, mental confusion, and faintness. The symptoms are brought on and aggravated by exercise, and are relieved by recumbency. The flatter the patient lies, the better he feels. It is due to a disturbance in the pressure relations in the cerebrospinal fluid, most commonly from leakage through the puncture hole to such an extent that the brain is left without its water cushion. It is most liable to occur when normal pressure existed within the canal before the puncture and when a large needle is employed. On the other hand, when the pressure is high, puncture often relieves headache as well as other symptoms. It should therefore be a fundamental principle in subarachnoid injection to retain or restore as nearly as possible normal pressure conditions in the sac. If the pressure is normal (from 40 to 130 mm. of water on lumbar puncture [Quincke]) as much fluid should be withdrawn as one intends to inject. If the pressure is abnormal—as measured while the patient is breathing and resting quitely, for straining may raise the pressure considerably—fluid is permitted to escape slowly under repeated control of its height until it is approximately normal, never below normal. If the pressure is very high, above 300, it is best not to reduce it below, say, 150 at the first puncture. The flow should be checked instantly if any distress appears, such as headache, dizziness, nausea or vomiting, or if there is a sudden marked lowering of pressure. The latter change, which might result even in sudden death, may occur when the communication between the spinal and cranial subarachnoid spaces is suddenly occluded, as may happen during lumbar puncture in case of tumor of the posterior fossa. Hence, even suspicion of the presence of such a condition contraindicates such puncture.

Position has a great deal to do with pressure relations in the cerebrospinal canal as well as with diffusion of substances through it. That this is the case has already been suggested by what has been said in connection with "puncture headache." When the patient is sitting, the normal pressure on cisternal puncture is zero or even negative, while on lumbar puncture it may be found to be as high as 130 mm. of water. When the patient is recumbent, the pressure on simultaneous lumbar and cisternal punctures will be found approximately equal. If, on such combined puncture, withdrawal of fluid from either opening fails to influence the pressure in both places, it is clear evidence of a block somewhere in the canal.

According to experiments by Goldmann,[180] verified by many others, injection of dyes into the spinal subarachnoid space stains the spinal cord and brain stem but not the cerebral hemispheres. The explanation for this observation is offered by Solomon, Thompson and Pfeiffer,[181] who, studying the circulation of phenolsulphonphthalein and of serum in the cerebrospinal system, find that under ordinary conditions there is not very much movement from one locus to another. The movement of the introduced substances depends on circulation of the cerebrospinal fluid, which is not very active, on diffusion, and on gravity effects. Dye introduced into cerebrospinal fluid in vitro will rise against gravity by diffusion, whereas blood serum seeks the lowest level. When serum and phenolsulphonphthalein are mixed, the serum tends to hold the dye and prevents diffusion to the extent shown when the dye is used alone. When blood serum is introduced into the subarachnoid space, we may assume that it will tend to reach the lowest portion of the cerebrospinal fluid system by a slow diffusion process. There is no evidence to show that there is a sufficiently active circulation of the cerebrospinal fluid to send the blood serum in a direction contrary to gravity. It seems probable that the blood serum introduced into the lumbar subarachnoid space will make its way cephalad only when the head is lower, or at least as low as the lumbar subarachnoid space. If effects on the higher portion of the nervous system are desired, the Trendelenburg position should be assumed for, say, an hour following lumbar injection. Even then, because of slowness of diffusion and rapidity of absorption, it must be assumed that blood serum does not reach the ventricles or the cerebral cortex in any great amount. In order to reach the brain, the point of election for introduction of serum is the cisterna magna. Indeed, by cisternal injection, we put the serum in at the point at which the most good will be done also in a diffuse condition. The serum will then be carried up over the cortex, down the spinal canal, and to the base of the brain. In spinal anesthesia, on the other hand, in which we deal with diffusible bodies the effects of which we desire to localize, the patient should not be allowed to assume a recumbent position without having his head well supported on pillows. The Trendelenburg position must, under these circumstances, be avoided.

The importance of the maintenance of an approximately normal composition of the cerebrospinal fluid is indicated, in the first place, by the elaborate mechanism that exists to protect it. While the blood promptly rids itself of added material by throwing it into the tissue spaces, it cannot contaminate the cerebrospinal fluid in this manner, for the choroid plexus[182] which secretes the fluid protects it against chlorides, bromides, iodides, nitrates, ferrocyanides, salicylates, acetates, methylene blue, fluorescein, biliary pigments, mercury and arsenic, as has been shown by Mestrezat, Sicard, Camp, Catton and others, though volatile substances, like ether, chloroform and, curiously enough, methenamine, pass into the cerebrospinal fluid. This selective action of the choroid militates strongly against our ability to medicate the central nervous system, and has been invoked to explain our helplessness against infections of this system in spite of our possession of specific remedies. They simply do not reach organisms that have gained access to this sheltered location.

179. Dana, C. L.: Puncture Headache, J. A. M. A. **68**: 1017 (April 7) 1917.

180. Goldmann, E. E.: Vitalfärbung am Zentral Nerven System, Arch. f. klin. Chir. **101**: 735, 1913.

181. Solomon, H. C.; Thompson, L. J., and Pfeiffer, H. M.: Circulation of Phenolsulphonphthalein in the Cerebrospinal System, J. A. M. A. **79**: 1014 (Sept. 23) 1922.

182. The author is fully aware of the alternate theory, according to which the cerebrospinal fluid originates in the perivascular lymph spaces of the brain, which discharge it chiefly into the lateral ventricles, the choroid plexus having to do with absorption rather than secretion. This does not, however, alter the pharmacologic facts or their therapeutic application.

While elimination into the subarachnoid space is thus very poor, absorption from it of diffusible substances and even of antiserums is remarkably rapid; for the subarachnoid system chiefly deals with absorption of the cerebrospinal fluid which is secreted within the cerebral ventricles. In view of this rapidity with which remedies leave the cerebrospinal fluid, even when introduced into it, one should not rely on treating syphilis or any other disease of the central nervous system by intrathecal methods exclusively. Even in cerebrospinal meningitis the intravenous use of antiserum is advocated in conjunction with its subarachnoid injection.

Though by means of injection we can set at naught this elaborate protection of the *sanctum sanctorum* of the system, we cannot with impunity alter the composition of the cerebrospinal fluid to any great extent. So sensitive is the nerve tissue that even irrigation of the spinal canal with physiologic sodium chloride solution produces marked irritation leading to convulsions and speedy death in many experiments, as shown by Weed and Wegeforth.[183] These authors found that irrigation of the spinal and cerebral subarachnoid spaces is much better tolerated by cats if the irrigating fluid is composed of sodium chloride, potassium chloride and calcium chloride in proper proportions (modified Ringer's solution, made up as follows: sodium chloride, 0.9 per cent; calcium chloride, 0.024 per cent; potassium chloride, 0.042 per cent) demonstrating that a fluid to be harmless to the nerve tissues must be not only isotonic but also as nearly isoionic as possible.

The great sensitiveness of the central nervous system to variations in the hydrogen ion concentration has been shown, among others, by Dandy and Blackfan,[184] who found that the slightest deviation from the neutral point of a solution of phenolsulphonphthalein, in the direction either of acidity or alkalinity, produced violent symptoms of irritation.

No wonder that irrigation with various of the commonly used antiseptics produced untoward reactions. None of them prolonged the life of meningitic cats, in the experiments of Wegeforth and Essick.[185] Flexner and Amoss,[186] experimenting with compound solution of cresol and strong silver protein (protargol), found these harmful rather than helpful.

It may be that ethylhydrocupreine is an exception to this general proposition. Pneumococcus meningitis seems to be amenable to subarachnoid injection of this substance. First employed successfully by Wolff and Lehmann in one case in 1913 by lumbar and ventricle injection, Wolff[187] reports a number (three) of additional cases treated by giving 0.05 Gm. of ethylhydrocupreine (optochine) in 10 cc. of distilled water, subthecally by lumbar puncture. Other clinicians, among them Leschke, Rosenow, Löwe and Meyer, and Steinbrink,[188] have also obtained encouraging results.

Arsphenamine as well as mercurials have been found much too irritating to be injected intrathecally. Hence the advocacy of using, for subarachnoid injection, arsphenaminized serum[189] and mercurialized serum.[190] The former seems to have secured sufficient success to suggest that this method is of some value, in addition to the ordinary systemic treatment, in incipient cases of syphilitic infection of the nervous system, to merit a brief description here. One hour after from 0.6 to 0.9 Gm. of arsphenamine or neo-arsphenamine has been given intravenously, 40 cc. of blood is withdrawn into sterile centrifuge tubes and allowed to coagulate. It is then centrifugalized. The following day, 12 cc. of serum is pipetted off and diluted with 18 cc. of sterile physiologic sodium chloride solution and the mixture is heated at 56 C. for half an hour. By means of puncture, some of the cerebrospinal fluid is withdrawn and the serum slowly injected, preferably by the gravity method.

It is the relative harmlessness of serum that makes it possible to employ antiserums intrathecally. Because antimeningococcus serum is antibacterial in its action and must come in intimate contact with the organisms to display its efficiency, its subarachnoid administration at the earliest possible moment in epidemic cerebrospinal meningitis must be considered obligatory, as it has reduced the mortality of this disease from the appalling figure of from 50 to 90 per cent to one of about 25 per cent. Earlier as well as more radical (intracisternal, intraventricular) use of it promises a still further reduction. So important is the earliest possible administration of antimeningitic serum that the physician should not hesitate to perform lumbar puncture on merest suspicion to secure fluid for examination, just as he would make a throat and nose culture on suspicion of diphtheria. Intrathecal injection of tetanus antitoxin, though it has given a lower mortality in experimental tetanus than has intravenous injection,[191] has been rather disappointing in clinical application. Antiserums are preferably, though not necessarily, diluted with an equal amount of sterile water to make them more nearly approximate the cerebrospinal fluid in composition.

The ideal solvent for medicinal agents is the patient's own spinal fluid. Thus, Stirling[192] uses, for spinal anesthesia, procaine hydrochloride crystals put up in sterile ampules which hold enough spinal fluid to dissolve the crystals. (Laboratories put up such ampules containing 100, 120, 150 and 200 mg. of procaine hydrochloride.) One centigram is given for each 5 Kg. of body weight. Sufficient spinal fluid is collected in the ampule to dissolve the crystals, after which the anesthetic solution is slowly introduced by lumbar puncture. It should be noted that lumbar anesthesia, even with the best technic, is more dangerous than other forms of anesthesia in a general run of cases. Hence it is indicated only for operations on the lower extremities and on the genito-urinary organs unsuitable for local anesthesia, and in patients for whom inhalation anesthesia is especially dangerous, as in those suffering from heart and lung diseases, especially in weak and elderly persons.

It is interesting and rather remarkable that oil is tolerated on subarachnoid injection. At least, Sicard and Forestier[193] have shown that this is true of lipiodol

183. Weed, L. H., and Wegeforth, Paul: Experimental Irrigation of the Subarachnoid Space, J. Pharmacol. & Exper. Therap. **13**: 317 (July) 1919.

184. Dandy, W. E., and Blackfan, K. D.: An Experimental and Clinical Study of Internal Hydrocephalus, J. A. M. A. **61**: 2216 (Dec. 20) 1913; Internal Hydrocephalus, Am. J. Dis. Child. **8**: 406 (Dec.) 1914.

185. Wegeforth, Paul; and Essick, C. R.: The Effect of Subarachnoid Injections of Antiseptics on the Central Nervous System, J. Pharmacol. & Exper. Therap. **13**: 335 (July) 1918.

186. Flexner, Simon; and Amoss, H. L.: Chemical Versus Serum Treatment of Epidemic Meningitis, J. Exper. Med. **23**: 683 (May) 1916.

187. Wolff, Siegfried: Ueber Meningitis bei Kindern, Deutsche med. Wchnschr. **51**: 1117 (July 3) 1925.

188. Steinbrink, Otto: Beitrag zur Heilbarkeit der Pneumokokkenmeningitis, Therap. d. Gegenw. **66**: 188 (April) 1925.

189. Swift, H. F., and Ellis, A. W. M.: The Treatment of Syphilitic Affections of the Central Nervous System, Arch. Int. Med. **12**: 331 (Sept.) 1913.

190. Byrnes, 1914.

191. Sherington, C. S.: Lancet **193**: 964, 1917.

192. Stirling, W. C.: Intraspinal Anesthesia in Genito-Urinary Surgery, J. Urol. **12**: 535 (Nov.) 1924.

193. Sicard, J. A., and Forestier, J.: L'huile iodée en clinique application thérapeutique et diagnostic, Bull. et mém. Soc. méd. d. hôp. de Paris **47**: 309 (Feb. 23) 1923.

(iodized poppy-seed oil), which they have employed by injection into the spinal canal for roentgenographic purposes. That it is not perfectly harmless is shown by Sharpe and Peterson,[194] who report a case in which injection of lipiodol, which was arrested at the site of a spinal block in the middorsal area, so aggravated the patient's symptoms and signs that the oil had to be removed five and one-half months later by laminectomy, at which were disclosed two encysted globules of lipiodol surrounded by numerous newly formed adhesions. In two other cases, the oil fifteen months later was still unabsorbed and evidently encysted. Hence the authors would restrict the use of lipiodol to those cases in which its aid is absolutely required for accurate localization of the lesion, and then use it only at lumbar puncture with the patient in the Trendelenburg position, so that, unabsorbed, it can later sink to the less important structures of the caudal spinal theca, where its presence produces little or no harm clinically. They warn against its use early, as a routine, and merely for confirmatory evidence. Denk[195] likewise warns against the possible irritating action of iodized oil used by cisternal puncture, and advises its use with utmost care and on imperative indication only.

Air has been introduced into the subarachnoid space for roentgenographic and even for therapeutic purposes. It certainly has been shown that air insufflation, done with proper care, is at least harmless.

From the standpoint of technic, we must distinguish between three different forms of subarachnoid injection: lumbar injection, cistern injection, and ventricle injection. Needless to say, for all of them strict asepsis must be practiced, as failure in this respect may lead to meningitis and death.

(To be continued)

194. Sharpe, William; and Peterson, C. A.: The Danger in the Use of Lipiodol in the Diagnosis of Obstructive Lesions of the Spinal Canal, J. Bone & Joint Surg. **8**: 348 (April) 1926.

195. Denk, W.: Ueber die Sicardsche Myelographie und ihre Ergebnisse, Arch. f. Klin. Chir. **140**: 208 (May 6) 1926.

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION. W. A. PUCKNER, SECRETARY.

ERYSIPELAS STREPTOCOCCUS ANTITOXIN.—An antitoxic serum prepared by immunizing animals against the toxin of the hemolytic streptococci of erysipelas.

Actions and Uses.—Reports have been published which indicate that the injection of erysipelas streptococcus antitoxin favorably affects the course of erysipelas by lowering the temperature, decreasing leukocytosis, causing the lesions to fade, and relieving the symptoms of toxemia.

Dosage.—100 cc. of the unconcentrated serum injected intravenously, or 15 cc. of the concentrated preparation injected intramuscularly or intravenously administered early in the disease, if possible. In severe cases or those seen late or in those which fail to respond to the first injection, repeated doses may be given as indicated.

H. K. Mulford Co., Philadelphia.

Erysipelas Streptococcus Antitoxin-Mulford.—This antitoxic serum is obtained by injecting horses intradermally with strains of hemolytic streptococci isolated by H. Amoss from human cases of erysipelas lesions, bleeding the horses and when test bleedings show the serum to have reached the desired potency, separating the serum, sterilizing it and preserving by the addition of 0.35 per cent of phenol. The product is claimed to possess both antitoxic and antibacterial immune bodies. It is marketed in packages of one 100 cc. vial.

OSCODAL.—Cod liver Oil Concentrate-Metz.—A preparation of the nonsaponifiable fraction of cod liver oil, containing the antiophthalmic and antirachitic fat soluble vitamins. It has 500 times the antiophthalmic (vitamin A) potency of cod liver oil when assayed by the method of the U. S. P. for cod liver oil, and its antirachitic (vitamin D) potency is such that 0.02 Gm. per day will suffice to initiate recalcification in the leg bones of young albino rats.

Actions and Uses.—Oscodal possesses properties similar to those of cod liver oil so far as these depend on the fat soluble vitamin content of the latter.

The experiments of Dubin and Funk (*J. Metabol. Research* **1**:467, 1923) seem to show that a cod liver oil extract prepared by the method used for the preparation of oscodal is efficient in controlling rickets and ophthalmia in rats on diets deficient in these vitamins. Louis Fisher (*J. Metabol. Research* **1**:481, 1923) has presented evidence to show that oscodal is as efficient in the treatment of clinical rickets as crude cod liver oil.

Dosage.—For infants or children, from 0.01 to 0.04 Gm. and for adults, from 0.04 to 0.06 Gm., three times a day.

Manufactured by the H. A. Metz Laboratories, Inc., New York. U. S. patent applied for. U. S. trademark 210,246.

Oscodal Tablets: Each coated tablet contains oscodal, 0.02 Gm., approximately representing the vitamin potency of cod liver oil, 2 cc. (30 minims).

Oscodal is manufactured from physiologically standardized cod liver oil which complies with the standards of the U. S. Pharmacopeia X. In addition, the oil is required to have (1) a content of fat soluble vitamin A approximately five times greater than that present in the U. S. P. product as determined by the U. S. P. assay, and (2) an antirachitic potency determined by the method of McCollum, Simmonds, Shipley and Parke (*J. Biol. Chem.* **51**: 41 [March] 1922) as modified by Steenbock and Black (*J. Biol. Chem.* **64**: 263 [June] 1925) using ration 2965, so that the administration of 0.02 Gm. of oil per day will suffice to initiate recalcification in the leg bones of young albino rats.

Oscodal is required to have 100 times the potency of the oil from which it is made when tested for its antiophthalmic and antirachitic potency by the methods used to assay the cod liver oil from which it is manufactured. To determine the potency of oscodal tablets, 100 tablets are powdered in a glass mortar; the powder is transferred to a paper thimble, placed in a Soxhlet extractor, and extracted with ether; the ether is evaporated off and the remaining material dissolved in vitamin-free peanut oil in the proportion of 1 to 100; the oil solution is then tested for its vitamin potency.

PITUITARY SUBSTANCE-L. & F. DESICCATED.—The pituitary gland of cattle, including the infundibulum and the anterior and posterior lobes, dried and powdered, without the addition of preservative or diluent.

Actions and Uses.—See Pituitary Gland, New and Nonofficial Remedies, 1926, p. 281.

Dosage.—From 0.06 to 0.13 Gm. (1 to 2 grains) daily.

Manufactured by Lehn & Fink, Inc., New York. U. S. patent 1,309,357 (July 8, 1919; expires 1936). No U. S. trademark.

Tablets Pituitary Substance-L. & F. Desiccated ½ grain.

The fresh glands are freed of extraneous matter, finely ground, spread on glass plates and dried in vacuo (15 mm.) at a temperature below 37 C. Pituitary substance-L. & F. desiccated is a grayish powder, practically odorless. One part represents approximately 4 parts of fresh gland.

ANTERIOR PITUITARY-L. & F. DESICCATED.—The anterior lobe of the pituitary gland of cattle, dried and powdered, without the addition of preservative or diluent.

Actions and Uses.—See Pituitary Gland, New and Nonofficial Remedies, 1926, p. 281.

Dosage.—From 0.2 to 0.6 Gm. (3 to 9 grains) daily.

Manufactured by Lehn & Fink, Inc., New York. U. S. patent 1,309,357 (July 8, 1919; expires 1936). No U. S. trademark.

Tablets Anterior Pituitary-L. & F. Desiccated, 1 grain.

The fresh glands are freed of extraneous matter, finely ground, spread on glass plates and dried in vacuo (15 mm.) at a temperature below 37 C. Anterior pituitary-L. & F. desiccated is a grayish powder, practically odorless. One part represents approximately 4 parts of fresh gland.

POSTERIOR PITUITARY-L. & F. DESICCATED.—The posterior lobe of the pituitary gland of cattle, dried and powdered, without the addition of preservative or diluent.

Actions and Uses.—See Pituitary Gland, New and Nonofficial Remedies, 1926, p. 281.

Dosage.—From 0.02 to 0.03 Gm. (3/10 to ½ grain).

Manufactured by Lehn & Fink, Inc., New York. U. S. patent 1,309,357 (July 8, 1919; expires 1936). No U. S. trademark.

Tablets Posterior Pituitary-L. & F. Desiccated, 1/10 grain.

The fresh glands are freed of extraneous matter, finely ground, spread on glass plates and dried in vacuo (15 mm.) at a temperature below 37 C. Posterior pituitary-L. & F. desiccated is a grayish powder, practically odorless. One part represents approximately 4 parts of fresh gland.

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SATURDAY, AUGUST 28, 1926

THE TREATMENT OF PERNICIOUS ANEMIA

Pernicious anemia has long offered problems of peculiar perplexity. Despite numerous disillusionments and many discouragements, investigators have not given up the hope of securing some worth-while solutions. The frequency with which the malady appears keeps it continually within the attention of the physician, so that interest is not permitted to lapse as it may in the case of the occasional epidemic disorder. The symptoms involve the hematopoietic, gastro-intestinal and nervous organ systems, for all of which helpful modes of treatment have long been available, leading to the recurrent hope that some of these may be found advantageous in pernicious anemia. Naturally, theories concerning etiology have not been wanting; but the varied efforts to cure the disease through knowledge of them have encountered discouragement owing to the salient circumstance that remissions are observed in most patients regardless of the sort of treatment they may have experienced. These spontaneous improvements, even in the severely anemic patients, and what has well been termed the "bizarre course" that their disease often runs, have made it notoriously difficult to determine accurately the effect of any procedure on the disorder. If, therefore, the admitted seriousness and importance of pernicious anemia justify and even provoke repeated effort in relation to its problems, it is highly important that these be given the most serious consideration. Medical history has afforded all too many instances of the unwisdom of overhasty generalizations concerning new therapeutic measures.

With this statement of appropriate reserve, we again revert to recent announcements [1] that seem to deserve careful thought. They deal with the alleged importance of suitable dietetic treatment of pernicious anemia. There is nothing essentially novel about this as a general proposal. The thesis that improper food can cause, and suitable food alleviate, anemia has often been defended. In the most recent applications of the general idea, however, cognizance is taken of the especial virtues that certain dietary ingredients may exhibit, particularly with reference to hematopoiesis. Thus, Whipple and Robscheit-Robbins and their associates [2] at the University of Rochester School of Medicine have extolled the value of liver, in particular, in accelerating blood regeneration following acute hemorrhage, and the value of iron added to the diet to decrease the anemia due to chronic loss of blood. Following these suggestions based on animal experimentation, Minot and Murphy [1] of the Harvard Medical School have subjected a considerable series of patients with pernicious anemia to a regimen including foods rich in "complete" proteins and iron—particularly liver—and containing an abundance of fruits and fresh vegetables, and relatively low in fat. The last restriction was based on somewhat empiric observations, involving in part the possibility of changing the intestinal flora, rather than to any direct influence on blood formation or destruction. Following the new diet, all the patients thus far carefully examined have shown "a prompt, rapid and distinct remission of their anemia, coincident with at least rather marked symptomatic improvement." The recollection of alleged similar benefits from repeated transfusion, splenectomy and drug therapy alone will make one duly reserved in the face of what seems to be a most promising therapeutic procedure; and the passing of a year or two will permit more accurate judgment as to the permanence and quality of the benefits already observed.

There is nothing in this recent undertaking at variance with the different hypotheses of causation of the anemia, whether due to a toxemia of gastro-intestinal origin, a vitamin deficiency, or a combination of etiologic factors. Liver, fruits and vegetables, in contrast with starch, sugar and fat in their usual dietary guises, supply liberally the food components that have been demanded. Koessler [1] and his co-workers at the University of Chicago have demonstrated that animals in a state of chronic vitamin A deficiency may develop a severe anemia that is relieved by suitable dietary changes. Vitamin exhaustion may open the way to infection and intoxication through altered permeability of the mucous membranes. The variety of symptoms thereby engendered in the pathogenesis of pernicious anemia may consequently call for liberal inclusion of vitamin-bearing foods in the diet. The Chicago pathologists have accordingly phrased their therapeutic suggestion as follows: The use of a rationally balanced diet which has proved itself thus far of decided value in the blood regeneration of patients suffering from severe

1. Minot, G. R., and Murphy, W. P.: Treatment of Pernicious Anemia by a Special Diet, J. A. M. A. **87**: 470 (Aug. 14) 1926. Koessler, K. L.; Maurer, Siegfried; and Loughlin, R.: The Relation of Anemia, Primary and Secondary, to Vitamin A Deficiency, ibid. **87**: 476 (Aug. 14) 1926.

2. Whipple, G. H.; Hooper, C. W., and Robscheit, F. S.: Blood Regeneration Following Simple Anemia, Am. J. Physiol. **53**: 151, 167 (Sept.) 1920. Whipple, G. H.; Robscheit, F. S., and Hooper, C. W.: Blood Regeneration Following Anaemia, ibid. **53**: 236 (Sept.) 1920. Whipple, G. H., and Robscheit-Robbins, F. S.: Favorable Influence of Liver, Heart and Skeletal Muscle in Diet on Blood Regeneration in Anemia, ibid. **72**: 408 (May) 1925 (cf. p. 41); Iron Reaction Favorable, Arsenic and Germanium Dioxide Almost Inert, in Severe Anemia, ibid. **72**: 419 (May) 1925.

anemias, aplastic as well as erythroblastic, is the most promising procedure in the treatment of certain anemias, especially pernicious anemia. The Harvard formula is more specific in the suggestion that liver or similar food may be somewhat more advantageous than any ordinary nutritious diet [3] without this.

SUPRARENAL FUNCTION

The suprarenal glands of man weigh only about 4 Gm. each, yet this small amount of tissue is essential to life. Survival after complete ablation of the glands is brief at best. Little wonder, then, that these structures have challenged the most careful attention of investigators. The glands are innervated by way of the splanchnics, and exhibit one of the few instances of the presence of true secretory nerve fibers. They possess a rich blood supply, receiving more blood per gram-minute than any other tissue of the body.[4] These facts by themselves suggest a prominent physiologic rôle, as was first recognized three quarters of a century ago by Addison in the description of the disease that bears his name and by Brown-Séquard in his experimental studies.

Investigation of the suprarenals since that day has brought forth a series of unexpected and often perplexing facts. The isolation of the highly potent epinephrine from the suprarenal medulla naturally lent some probability to the conjecture that this hormone is physiologically important. The now well demonstrated circumstance, however, that the medulla of the gland can be removed by cautery without affecting the health of an animal, and the added fact that epinephrine will not save life after suprarenalectomy, led to the conclusion that the suprarenal cortex, and not the medulla, is essential to life. This has been evidenced anew by recent experiments of Banting and Gairns [5] at the University of Toronto. Lucas,[6] who examined the blood of their animals, found the most noticeable change following double suprarenalectomy to be the decided increase in concentration of the blood indicated by the increase in total solids, total nitrogen and the ratio of corpuscles to plasma. The removal of the suprarenals had no appreciable effect on the cholesterol content of the blood stream or the ratio of cholesterol ester to free cholesterol. The tendency for an increase in the urea and nonprotein nitrogen, and the decrease in the percentage of chlorides in the blood, are further important chemical changes. The increase in urea and nonprotein nitrogen seems to depend in some way on the ability of the kidney to excrete, since the administration of saline solution reduces them only when accompanied by diuresis. The percentage of chloride in the blood can be maintained at its normal level by the administration of saline solution, regardless of whether the kidney is excreting or not. According to Banting and Gairns, the postmortem findings of enlarged lymph glands, degeneration of the liver cords, and nephrosis of the kidney strongly indicate the accumulation of a toxic substance. Further evidence to support this fact is that the blood of dogs which died as a result of desuprarenalization is toxic. A protein diet with its consequent accumulation of the protein split products shortens the duration of survival and hastens death in partially desuprarenalized dogs.

This is a return to the older view of a detoxifying function of the suprarenals. It applies presumably to the cortex. For the medullary substance there remains Cannon's much debated theory of the emergency function. According to this conception the neurosecretory mechanism is thrown into activity in times of nervous and bodily stress, with a resultant outpouring of epinephrine, which serves to facilitate the requisite reactions to such stress. Thus, the blood pressure rises, the blood is shunted to the brain and muscles, and muscular contraction is made more efficient.

PROTEIN AND LACTATION

The problem of the rôle of protein in nutrition seems to be of perennial interest. Like many highly debated themes, it appears to have become the subject of agitation as well as investigation, with the result that one may find devotees of the most antipodal views. Furthermore, among these the pendulum of preference seems to swing from one extreme to another, while moderation in protein intake remains a norm for those not given to excesses or remissions of any sort. A few years ago, much emphasis was placed on the asserted advantage of a dietary comparatively poor in protein. The advocates of a low-protein regimen were insistent on the physiologic economy and blessings that it was assumed to represent. In contrast with this, a recent article [1] presents the arctic experiences of the explorer Stefansson, who lived about nine years on a diet essentially of meat and water. The testimony of this keen observer regarding both himself and the Eskimos having similar dietary habits with whom he became familiar in the Far North speaks against any deleterious effect from the liberal ingestion of protein. The reviewer insists that no ill effects could be detected after the long continued almost exclusive use of meat. Stefansson affirms that his observations on the health and longevity of Eskimos led him to the conclusion that the high protein diet has no deleterious effects on their circulation or kidneys. He does feel, however, that the mixed diet to which they have resorted in recent years

3. It should be noted that somewhat similar suggestions were put forward in 1923 by Gibson, R. B., and Howard, C. P.: Metabolic Studies in Pernicious Anemia, Arch. Int. Med. **32**: 1 (July) 1923.

4. Hooker, D. R.: The Suprarenal Glands, Glandular Therapy, Chicago, American Medical Association, 1925.

5. Banting, F. G., and Gairns, S.: Suprarenal Insufficiency, Am. J. Physiol. **77**: 100 (June) 1926.

6. Lucas, G. H. W.: Blood and Urine Findings in Desuprarenalized Dogs, Am. J. Physiol. **77**: 114 (June) 1926.

1. Lieb, C. W.: The Effects of an Exclusive, Long-Continued Meat Diet, J. A. M. A. **87**: 25 (July 3) 1926.

is making them prematurely old and is producing infirmities in those past middle life similar to those of civilized communities. He considers the prime cause of this to be increase of constipation, which has everywhere accompanied the adoption by the Eskimos of imported foods.

The experimentalists also are not without conflicting records. Not long ago an English investigator [2] ventured the hypothesis that the lactating mother rat, by consuming a diet rich in protein, produces a milk that is poisonous to her young, while the mother herself remains in good condition. Referring to this conclusion, Nelson [3] has protested that it is not in harmony with our knowledge of the effects of the dietary nutrients on the quality and quantity of the milk produced by the lactating cow. It seemed highly improbable, she adds, that the dietary protein per se could be the cause of the difficulties noted, for the addition of protein to the lactating cow's diet to increase the milk yield is a well established practice among dairymen, and a general review of the literature of the subject has shown no accounts of a deleterious milk being produced thereby.

The explanation of the symptoms observed in offspring nursed by mothers that lived on a diet rich in protein seems to be clear. According to Nelson's studies at Yale University, the "spasms" are an expression primarily of a deficiency in vitamin B rather than of richness in protein in the maternal diet. Simmonds [4] of Johns Hopkins University has also corroborated the conclusion that protein fed at high levels of intake during lactation is not injurious to the young, but rather stimulates the production of milk of good quality and the consequent rapid growth of the young. Hence, while science is struggling with the problems of the possible relation of nitrogenous waste to the pathogenesis of hypertension and nephritis, we may rescue the proteins, for the present at least, from the odium of responsibility for unsuccessful lactation.

THE INORGANIC COMPOSITION OF BONE AND BLOOD

It has long been realized that the bones are a storehouse of phosphorus and calcium in particular. Probably more than 99 per cent of the latter element in the body belongs to the bones. Eighty-five per cent of their mineral matter can be accounted for as calcium phosphate. Curiosity naturally arises with respect to the variations that the bones may undergo in their mineral make-up under varying conditions of health and of disease. One of the final contributions of the late John Howland [5] of Johns Hopkins University dealt in a characteristically thorough manner with the problem of the nature of the inorganic salts in rachitic and nonrachitic bones. Mineral analyses of these have often been reported; for the most part, however, the technic has been unsatisfactory. According to these studies the calcium phosphate in all bones, rachitic and nonrachitic, appears to be tricalcium phosphate. Different bones of the same individual have the same inorganic composition. Whenever it is possible to determine accurately the activity of the rachitic process, as in rats, it can be shown that the ratio of calcium phosphate to calcium carbonate is greater in the normal than in the rachitic animal. This is presumably also true in human rickets. It is interesting to learn that precipitates made from solutions comparable in their inorganic composition to the serum of normal and rachitic animals contain essentially the same calcium phosphate compound as bone. The ratio of calcium phosphate to calcium carbonate, other conditions being the same, varies directly with the inorganic phosphorus content of the solution. According to the Baltimore investigators, when calcification occurs the type of calcium phosphate compound laid down appears to be independent of the inorganic phosphorus concentration of the serum. The ratio of calcium phosphate to calcium carbonate, however, is higher, the greater the inorganic phosphorus concentration of the serum. Local conditions may determine the localization of the calcification, but the composition of the deposit depends on that of the body fluids and ultimately on the composition of the serum.

There is growing evidence that the total content of calcium in the blood is by no means an index of the calcium ions in the circulating fluids. Ionized calcium is likely to represent the "physiologically active" manifestation of the element. The latest evidence [6] secured in various types of tetany indicates that whenever active tetany is present there is a profound decrease in the free calcium. A low calcium concentration without tetany is possible (as in nephritis), but here the free calcium is practically unchanged. When cure was effected in the cases of infantile tetany, the free calcium reached its normal level, 5 mg. for each hundred cubic centimeters of serum, before the total calcium came up to the normal level of 10 mg. According to Pincus, Peterson and Kramer, the failure of the calcium concentration of the serum in tetania parathyreopriva to increase after irradiation with the mercury vapor quartz lamp as it does in patients with infantile tetany makes it highly probable that infantile tetany is not a form of parathyroid tetany, and this assumption is strengthened by the absence of any increase of the inorganic phosphorus in the serum of children with tetany comparable to that found in the serum of dogs after parathyroidec-

2. Hartwell, G. A.: Biochem. J. **15**: 140, 1921; **15**: 563, 1921.
3. Nelson, P. Mabel: Maternal Diet and Lactation, J. Home Economics **18**: 383 (July) 1926.
4. Simmonds, Nina: Am. J. Hyg., Supp. **4**: 23 (Sept.) 1924.
5. Kramer, Benjamin; and Howland, John: The Quantitative Estimation of Calcium, Magnesium, Phosphate and Carbonate in Bone, J. Biol. Chem. **68**: 711 (June) 1926. Howland, John; Marriott, W. M., and Kramer, Benjamin: Studies upon the Inorganic Composition of Bones, ibid., p. 721.
6. Pincus, J. B.; Peterson, H. A., and Kramer, Benjamin: A Study by Means of Ultrafiltration of the Condition of Several Inorganic Constituents of Blood Serum in Disease, J. Biol. Chem. **68**: 601 (June) 1926.

tomy. The fact that the free calcium of the serum may remain constant in patients with chronic nephritis, even when the total calcium is definitely reduced, serves to explain why such patients do not develop convulsions.

Current Comment

THE THYROID AND HAIR GROWTH

The falling of the hair is a familiar manifestation of certain disease states. It is so characteristic of cretinism and myxedema that the symptom has been associated by clinicians with hypothyroidism. Improvement in hair growth usually follows successful medication with thyroid. In certain types of thyroidal hyperfunction, the hairiness of the body may become augmented to an extent that makes it noticeable. The relation of cause and effect in all these instances is not readily established. The growth of hair presumably has a nutritional background of influence that should not be overlooked. In animals the hair coat usually is a dependable indication of their general nutritive condition. The thyroid functions are intimately related to the processes of nutrition in the organism, as the measurable effects on the metabolism clearly evidence. One is impelled to consider, therefore, whether the conditions of hair growth observed in abnormalities of thyroid activity are attributable directly to glandular influences or rather to the associated disturbances in the nutritive states. Recent experiments by Chang [1] at the University of Chicago tend to support the theory of a specific thyroid influence. Animals deprived of their thyroids show retardation of hair growth, as do those that are undernourished. Thyroid feeding improves the development of the hair coat in either case, even when there is a continued loss of weight through chronic underfeeding. What component of the gland is responsible for this hair growth effect remains to be ascertained.

STREET RISK OF CARBON MONOXIDE POISONING

The combustion of millions of gallons of gasoline each year is providing facilities and comfort undreamed of a few decades ago. It has often been remarked that each form of progress is carried out to the detriment of some one. The cost of changes that benefit the many not infrequently involves the comfort of a few. Manifold advantages sometimes promote minor ills. This seems to apply to the gasoline engine, which has revolutionized motor traffic throughout the world. Only a few years ago, chronic intoxication with carbon monoxide was a medical rarity, usually chargeable to leaky gas pipes that allowed the escape of contaminating "water gas." Today, carbon monoxide is recognized as a menace of automobile exhaust gases. The annual records of deaths through careless exposure in badly ventilated garages have begun to arouse attention; at any rate, the danger is understood even if it may too often still be disregarded. When, in 1923, Henderson and Haggard [1] of Yale University included city streets in the list of possible harmful localities with respect to the presence of the deadly gas, there was some hesitation in believing that the "free air" outdoors could ever become really dangerous to health. Observations recently reported [2] from Philadelphia actually support the existence of a definite street risk of repeated or chronic slight carbon monoxide anoxemia in congested mercantile districts of our large cities. At any rate, it is demonstrated that patrolmen who supervise heavy traffic movement may manifest symptoms of malaise at the end of a busy day's work; and the offensive exhaust gas has been incriminated by demonstration of a saturation of the hemoglobin of the blood to a maximum value in some instances of 30 per cent. Relief is not difficult when once the cause of harm is known.[3]

1. Chang, H. C.: Specific Influence of the Thyroid Gland on Hair Growth, Am. J. Physiol. **77**: 562 (Aug.) 1926.

1. Henderson, Yandell; and Haggard, H. W.: Health Hazard from Automobile Exhaust Gas in City Streets, Garages and Repair Shops, J. A. M. A. **81**: 385 (Aug. 4) 1923.
2. Wilson, Elizabeth; Gates, Irene; Owen, H. R., and Dawson, W. T.: Street Risk of Carbon Monoxide Poisoning, J. A. M. A. **87**: 319 (July 31) 1926.
3. Walton, D. C.; Eldridge, W. A.; Allen, M. S., and Witherspoon, M. G.: Carbon Monoxide Poisoning, Arch. Int. Med. **37**: 398 (March) 1926.

Association News

MEETING OF THE COUNCIL ON PHYSICAL THERAPY, HELD AT ASSOCIATION HEADQUARTERS, MONDAY, JULY 19, 1926

The meeting was called to order by the Chairman, Dr. Mock, at 11:15 a. m., with the following members in attendance: Drs. Bovie, Compton, Pemberton, Mock, Warthin, Desjardins, MacKee, Williams, Granger, West and Fishbein, and Mr. Holmquest.

The minutes of the second meeting of the Council were approved.

REPORT OF COMMITTEE ON FIELD, SCOPE AND PRESENT STATUS OF PHYSICAL THERAPY

Dr. Mock presented the report of the Committee on Field, Scope and Present Status of Physical Therapy. It was agreed that the report be considered by the members of the Council, and that a final draft be prepared for publication.

COMMITTEE ON ORGANIZATION

Dr. Warthin reported for the Committee on Organization concerning the rules governing acceptance of products by the Council.

REPORT OF COMMITTEE ON EDUCATION

Dr. Bovie stated that there had been no meeting of the committee, but that he had made changes in the report as previously submitted. On request, he read the report as he had rewritten it. It was agreed that this report be given separate consideration by the members and then issued for publication.

It was agreed that the rules of the Council be put into type at once and sent to each member of the Council, and that their publication in THE JOURNAL be made as soon as they have been put into final form.

On request, Mr. Holmquest, Secretary, read a statement of his impressions regarding the work of the Council.

A recess for luncheon was taken at 12:45 p. m.

The Council reconvened at 2:10 p. m., all those being present that were in attendance at the morning session, with the exception of Professor Compton.

ASSIGNMENTS OF SUBJECTS FOR ARTICLES IN JOURNAL

The Council discussed the assignments of subjects for various articles on definite known facts regarding heat, light, electricity, etc.

It was suggested that a Committee on Nomenclature and Definition be appointed from among the members of the Council, and that the report of that committee constitute an article on nomenclature.

The Council agreed that it would be well to have members of the Council act as editors of articles on certain subjects, such as heat and light, and each editor secure six or eight articles on his subject, which he edit and submit to the Council for publication.

The first of January, 1927, has tentatively been set as the time for the beginning of publication of these articles.

FORM OF PRESENTATION OF ARTICLES

The Council discussed the plan of procedure for submission of articles for acceptance, and a committee was appointed to draw up a plan for the presentation of articles.

LETTER AND ARTICLE FROM AN INTERESTED PHYSICIAN

Dr. Mock presented a letter received from a physician submitting a manuscript for the criticism of the Council. The Secretary of the Council was instructed to write to the physician that the matter had been presented to the Council, and that it was the decision of the Council that it was not within its province to review manuscripts.

COMMITTEE ON STANDARDIZATION

It was moved that the Council appoint a Committee on Standardization. The motion was seconded and carried.

DATE OF NEXT MEETING

On motion of Dr. Pemberton, it was voted that the next full meeting of the Council be held the second Friday in January, 1927.

The Council adjourned at 4 p. m.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

CALIFORNIA

Physicians Cited.—The state board of medical examiners has issued citations for the following physicians to appear before the board at the October meeting to show cause why their license should not be revoked for alleged violation of the narcotic law:

Dr. Howard Lee Moffatt, Los Angeles.
Dr. Harrison B. Hulse, Los Angeles.
Dr. Duncan Ernest Stewart, Los Angeles.

Hospital News.—Dr. Charles P. L. Mathe, San Francisco, addressed a staff meeting at the Mercy Hospital, San Diego, August 27, on "Urology: Some Advances."——The Ripon Hospital is reported to have been destroyed by fire, August 13; none of the patients were injured.——Dr. Stuart Pritchard, Battle Creek, Mich., addressed a special meeting of the Salt Lake County Medical Society at Holy Cross Hospital, recently, on "Bronchiectasis"; Elmer V. McCollum, Ph.D., Baltimore, recently addressed another special meeting of this society on "Recent Research in the Vitamin Field."

University News.—During the last year, Stanford University Medical School, San Francisco, received $5,000 from Mrs. Dorothy Fries Lilienthal to establish a scholarship in memory of her mother, the income only to be used for the purposes of the scholarship; $9,000 from Mr. Roy N. Bishop for the Wellington Gregg Fund for research work on diseases of the kidney; $300 from the American Medical Association for therapeutic research; $2,000 from Adolf Barkan as a contribution to the historical department of the Lane Medical Library; a number of physicians interested in this library have subscribed to a fund amounting to about $1,000 a year for five years; collections for the first year were $1,110; also from Mrs. S. M. Haslett, $100 to establish a fund for sick children, payable in like sums yearly.

CONNECTICUT

Decrease in Death Rate in 1925.—The U. S. Department of Commerce announces that the 1925 death rate in Connecticut was 11.25 per hundred thousand of population, as compared with 11.30 in 1924. The principal decreases in 1925 were in the death rates for tuberculosis and diphtheria, and the principal increases in rates were from heart disease, nephritis, influenza and automobile accidents.

Camp for New Haven Children.—A camp is conducted at Branford during the summer by the Organized Charities Association of New Haven for children who need a vacation. The cottage at the camp accommodates twenty children, and in the 1925 season the average gain of the 145 children on vacation was 2 pounds and 11 ounces. During 1925, applications to go to the camp were made for 369 children, 133 of whom could not be accepted because of lack of accommodation, and ninety-one were rejected because their needs were not acute. The Branford camp's current expenses for eight years have been met by the New Haven *Register* through an appeal for a "fresh air fund." An addition to the cottage this year makes it possible to accommodate forty children at one time. Each child is given a physical examination by a physician, and his recommendations as to diet and care are carried out as far as possible.

FLORIDA

Increase in Death Rate.—The U. S. Department of Commerce announces that the 1925 death rate in Florida was 13.35 per hundred thousand of population, as compared with 12.92 in 1924. The increase is accounted for largely by increases in death rates from nephritis, automobile accidents, influenza, heart disease, homicides, railroad accidents and accidental drowning. There was a decrease in 1925 in the death rates from measles, malaria and tuberculosis.

Medical Society Reorganized.—At the recent reorganization of the Tri-County Medical Society at Fort Pierce, the Palm Beach County Medical Society was host at a dinner in honor of Dr. Henry Mason Smith, Tampa, president of the state medical association. The Tri-County Medical Society, which heretofore has included Indian River, Okeechobee and St. Lucie counties, will now include also Martin County, and will be known as the Four Counties Medical Society. Dr. Hady C. McDermid, Okeechobee, was elected president; Dr. James W. Bishop, Fort Pierce, vice president, and Dr. Grover C. Hardie, Fort Pierce, secretary. Dr. Roy O. Cooley, West Palm Beach, was toastmaster at the dinner, and among the speakers were Dr. John G. DuPuis, Lemon City, councilor from the Eleventh District, and Dr. John E. Hall, West Palm Beach, councilor from the Fifteenth District.

GEORGIA

Sorority Raises Fund for Healthmobile.—The Phi Mu Sorority is reported by the Atlanta *Journal* as raising an endowment fund of $50,000 for the healthmobile, operated by the state board of health. A contribution of $3,000 from the sorority enabled the state board to place this outfit in operation again, August 9, after its tours had been suspended for lack of funds. The state board has arranged to have the healthmobile, for the next few weeks, work on a schedule on the basis of one day for each 1,500 persons in a county. Physical examinations will be given to children under 7 years of age and to mothers; moving pictures, illustrating sanitation and hygiene, and health lectures will be given daily. Dr. Alva Gwin of Oxford, Ala., is in charge of the healthmobile.

IDAHO

State Medical Meeting.—The annual meeting of the Idaho State Medical Association will be at Sandpoint, September 2-4, under the presidency of Dr. Nathaniel R. Wallentine, Sandpoint. The annual banquet will be Friday evening. Among the guests will be Dr. John M. Dodson, Chicago, "Organized Medicine"; Dr. Mitchell Langworthy, Spokane, Wash., "Fractures from a Practical Standpoint"; Dr. George F. Strong, Vancouver, "Cardiac Pain"; Dr. John C. Moore, Seattle, "Goiter"; Dr. Emile F. Holman, San Francisco, "Treatment of Pulmonary Abscesses"; Dr. Robert C. Coffey, Portland, "Principles of Surgery of the Large Intestine Including the Upper Rectum"; Dr. Alfred B. Spalding, San

Francisco, "Bartholin's Glands, Skene's Glands and the Cervix as Foci of Infections Which Cause Rheumatism"; Dr. Robert F. E. Stier, Spokane, Wash., "Results of Pollen Extract Treatment of Hay-Fever in the Northwest." The Idaho Public Health League will meet, Friday evening, following the banquet, and will be addressed by Dr. Frederick Epplen, Spokane, "The Washington League"; by Dr. James L. S. Stewart, Boise, Ida., "The Idaho League," and by Dr. Herman P. Marshall, Spokane, "Public Health Leagues."

ILLINOIS

Liquor License Revoked.—The district prohibition administrator with headquarters in Chicago announced, August 23, it is reported, the revocation of the liquor license of Dr. Arthur J. Rissinger, Lake Forest.

Society News.—The Madison County Medical Society met at the Alton State Hospital, Alton, August 6, on the invitation of Dr. Joseph H. Ellingsworth, the managing officer, who, with other members of the staff, gave a psychopathic clinic. ——Dr. Frank G. Norbury addressed the Pike County Medical Society, Griggsville, August 5, on "Encephalitis."—— Dr. Gustaff Henry Mundt, Chicago, president-elect, Illinois State Medical Society, addressed the Adams County Medical Society, August 12, on the occasion of the annual picnic at Camp Irwin, near Quincy.

Drive on Diphtheria.—The state health director has designated September and October for an intensive campaign against diphtheria in Illinois. He has been assured cooperation from the medical profession, health agencies and civic organizations, and other public persons are requested to assist by broadcasting the knowledge that toxin-antitoxin will immunize children against diphtheria; literature to that effect will be distributed in every city and village in the state. Similar campaigns will be conducted simultaneously throughout North America in accordance with the endorsement of the Conference of State and Provincial Health Authorities of North America.

Chicago

Hospital News.—Construction will soon start on a $100,000 addition to the Municipal Tuberculosis Sanitarium, at Crawford and Bryn Mawr avenues.

Liquor Licenses Revoked.—The local prohibition administrator, Mr. E. C. Yellowley, announced, August 23, it is reported, the revocation of the liquor licenses of the following:

Dr. Max Bornstein	Dr. Louis J. Halpern
Dr. Frederick R. Schmidt	Dr. George E. O'Grady
Dr. Fred C. Cade	Dr. Robert N. Hedges
Dr. Jacob S. Grove	

The liquor license of Alexander R. Langerman, 4300 South Michigan Avenue, a druggist, was also reported revoked.

Personal.—Dr. Carl A. Hedblom, professor of surgery, University of Illinois, will deliver a series of lectures before the sixth annual summer school of the Vancouver Medical Association, Vancouver, B. C., September 13-16.——Dr. Gottlieb A. Lurie has been assigned to the U. S. Coast Guard cutter *Unalga* stationed at Juneau, Alaska; later this boat will ply between Seattle and San Francisco in the coast guard branch of the U. S. Public Health Service.——Jacques J. Bronfenbrenner, Ph.D., Rockefeller Institute for Medical Research, New York, addressed the Bacteriology Club at the University of Chicago, August 19, on "Experimental Syphilis in Rabbits."

INDIANA

Hospital News.—The trustees of the Reid Memorial Hospital, Richmond, have let the contract for the construction of a three story addition, costing about $175,000.

Dr. Nafe Resigns.—Dr. Cleon A. Nafe, superintendent of the city hospital, Indianapolis, submitted his resignation to the board of public health of that city, August 13, in order to devote his time to private practice.

Personal.—Dr. and Mrs. Alfred E. Rhein, Rosedale, will sail, September 2, for Vienna, where Dr. Rhein will study for about a year.——Dr. Marion A. Emshwiller has been appointed secretary of the board of health of Montpelier, to succeed Dr. James A. Taylor, resigned.

Society News.—Dr. Horace G. Read, Tipton, was recently elected president of the Ninth Councilor District Medical Society, and Dr. Jean V. Carter, Tipton, secretary-treasurer. ——Dr. Amos Carter, Rockville, entertained the Parke-Vermilion County Medical Society recently at the tuberculosis sanatorium.

IOWA

Accidents a Leading Cause of Death.—An analysis of the death claims paid during 1925 by the Equitable Life Insurance Company of Iowa shows, it is reported, that accidents of all kinds were the leading cause of death among its policyholders, and that second on the list of causes of death was organic heart disease. In settling 689 death claims during the year, the company paid out $1,429,681.

KENTUCKY

Hospital News.—The new city hospital at Bowling Green was opened, August 2; Dr. Irvin Abell, president of the state medical society, delivered an address; the mayor, Mr. A. S. Hines, presided at the ceremony.

Personal.—Dr. Samuel J. Brownstein, Louisville, has been appointed local registrar of vital statistics on the state board of health, to succeed Dr. Lester A. Crutcher.——Dr. John F. Kirksey has been reelected president of the chamber of commerce of Mayfield.——Dr. Robert Sory, U. S. Public Health Service, has been assigned in charge of the trachoma hospital recently established at Richmond, and will take up his residence there about September 1, although the hospital will not be completed for some time.

Society News.—Fifty-six members of the Fayette County Medical Society were guests of Dr. and Mrs. Joseph A. Stucky and Dr. and Mrs. William S. Stucky, August 10, at a buffet supper; Dr. Charles N. Kavanaugh read a paper on "Tularemia."——The Christian County Medical Society held a barbecue at the home of Dr. Benjamin A. Caudle, Newstead, August 17, and was addressed by Dr. Richard A. Barr, Nashville, Tenn., on "Medical Treatment of the Surgical Abdomen."——The Mason County Medical Society and the Mason County Health Department conducted a tuberculosis clinic at Maysville, August 10-11, at which about ninety-two persons were examined and advised concerning tuberculosis.

MAINE

Report of Public Health Association.—The Maine Public Health Association, in its report for 1925, states that several counties—Franklin, York, Penobscot, Hancock and Somerset —within a period of little more than twelve months disbanded their county public health associations, and became instead a county committee of the Maine Public Health Association. Formerly they developed their own local programs and budgets; now the county committees are appointed by the state association. The change in administration has increased the participation of these counties in health work, although the state association undertook no activities in the counties except in conference with the county committees. The state association, in cooperation with the state medical association, placed in the library of every physician a copy of the latest handbook on the diagnosis and treatment of cancer; it distributed more than 2,000 tooth brushes to children whose parents either could not or would not buy them, carried on state-wide publicity in newspapers throughout the year, and conducted two health institutes, principally for school teachers, in cooperation with the state department of education. Its clinical program was approved by a committee of the Maine Medical Association; four clinics for crippled children were held during 1925; there were also tuberculosis clinics, infant and preschool clinics, and dental clinics held under the auspices of the association; it originated the Maine Three Quarter Century Club, which has a membership of more than 15,000, each 75 or more years of age. The average length of life in the state in 1923 was reported to be 52.5 years, while for the registration area of the United States, it was 44.9 years. The headquarters office of the Maine Public Health Association is in the State Trust Building, Augusta.

MASSACHUSETTS

Personal.—The governor has reappointed Dr. John M. Birnie, Springfield, to the state board of registration in medicine.

William Thompson Sedgwick Memorial Lecture.—Prof. Thomas Hunt Morgan of Columbia University, New York, and the Marine Biological Laboratory, delivered the fifth William Thompson Sedgwick lecture, July 27, at Woods Hole, on "Genetics and the Physiology of Development." This lecture will be published in book form under the auspices of the department of biology and public health of the Massachusetts Institute of Technology, of which, for many years, Professor Sedgwick was the chief, and where this lecture heretofore was given annually since 1922. The previous

lecturers include Dr. William H. Welch, Johns Hopkins University School of Hygiene and Public Health, Baltimore; Dr. Edmund B. Wilson, Columbia University, New York; Winthrop J. V. Osterhout, Sc.D., of the Rockefeller Institute, and Dr. Charles V. Chapin, health officer of Providence, R. I.

MINNESOTA

Personal.—Dr. Charles H. Mayo, Rochester, brigadier general, O. R. C., has been ordered to active duty for training for a period of two weeks at Carlisle Barracks, Pa., effective, September 12.

Public Hearing on Iodized City Water.—The city commissioners of Duluth held a public hearing, August 10, on the question of placing iodine in the city water supply as a means of preventing goiter. According to the Duluth *Herald,* the hearing was indecisive. Among others who appeared were physicians, some of whom opposed the measure and some of whom favored it. However, an ordinance will be prepared providing for iodization of the city water supply, and introduced in the council at the next meeting.

MONTANA

Health Association Election.—Dr. Thomas F. Walker, Great Falls, was elected president of the Montana Health Association at the annual meeting, July 14, at Billings, and Dr. Samuel E. Leard, Livingston, vice president.

Trachoma Clinic on Indian Reservation.—A six day trachoma clinic has just been completed at Browning on the Blackfeet Reservation under the direction of F. C. Campbell, supervisor, Northwest Indian Reservations. A similar clinic was held at Browning two years ago, and the latest survey showed that by this surgical procedure, the statistics fell from 30 per cent to 3 per cent of the population. During this last week, 130 trachoma patients were operated on. The methods used were grattage—Darier's method—on the milder types and in the chronic forms, tarsectomy, three senile cataracts, two enucleations with immediate implantation of a gold ball, six cases of pterygium, eight cases of entropion, one tattooing with india ink for leukoma of the eye of an Indian girl, two cases of chronic glaucoma, several minor defects, and a rare form of lipoma of both corneas. The following persons of the Indian Service were assigned by Commissioner Charles H. Burk to assist at the clinic:

Indian Hospital at Browning.

Dr. Laurence Webster Fox, Philadelphia.
Dr. Charles E. Yates, traveling specialist in trachoma, Browning, Mont.
Dr. George O. Keck, Fort Lapwai tuberculosis sanatorium, Idaho.
Dr. Hugh Mullarky, Flathead reservation, Montana.
Dr. John G. Veldhuis, Fort Peck reservation, Montana.
Dr. Clarence D. Fulkerson, Fort Peck reservation, Montana.
Dr. C. A. Kerner, Tongue River reservation, Montana.
Dr. Burton L. Stevenson, Blackfeet reservation, Montana.
Dr. James W. Craig, Blackfeet reservation, Montana.
Dr. Herman E. Levin, Blackfeet reservation hospital, Montana.
Dr. Mary H. McKee, Fort Berthold reservation, North Dakota.
Dr. Howard W. Bateman, Choteau, Mont.
Dr. Earle Strain, Great Falls, Mont.
Dr. Paul O. Neraal, Cut Bank, Mont.
Dr. Walter L. DuBoise, Conrad, Mont.
Dr. Charles F. Coulter, Great Falls, Mont.
Joseph Woodlock, Wyoming.
J. L. Livingston, Fort Belknap reservation, Montana.
C. H. Minette, Cut Bank, Mont.
William Kyle, Conrad, Mont.

Among those present were Major Gen. Hugh L. Scott, Philadelphia, U. S. Indian Commissioner; Matthew K. Sniffen, Philadelphia, secretary, Indian Rights Association; F. C. Campbell, Browning, Mont., supervisor, Northwest Indian reservations; Forrest Stone, acting superintendent, Blackfeet reservation; L. W. Shotwell, superintendent, Rocky Boy reservation, Montana, and Hon. Scott Leavitt, Montana, chairman of Indian Affairs in Congress.

NEW MEXICO

Personal.—Dr. Miguel F. DesMarais, Las Vegas, has been appointed superintendent of the state insane asylum to succeed Dr. Franklin H. Crail.

Health Officer Resigns.—Dr. Ernest W. Prothro, health officer of McKinley County, has resigned, and Dr. Arthur M. Washburn has been appointed his successor. Dr. Washburn recently took special training with one of the health units of the Rockefeller Foundation.

Investigation of Intestinal Disease.—Dr. J. G. Wilson, U. S. Public Health Service, has been detailed by the Surgeon General to conduct the investigation of "Rocky Mountain Diarrhea." Mrs. W. S. Enlows, a bacteriologist of the service, has arrived in Santa Fe from Washington to establish a laboratory in connection with the investigation (THE JOURNAL, June 26).

NEW YORK

Personal.—Dr. M. Luise Diez has been appointed associate director of the division of maternity, infancy and child hygiene of the state department of health.

Society News.—Dr. Wendell C. Phillips, New York, President of the American Medical Association, addressed the annual meeting of the Oneida County Medical Society at Newport, July 13.

Hospital News.—The general construction contract for the U. S. Veterans' Hospital to be erected near Northport, L. I., was awarded, August 12, on the basis of $2,719,956; it will be a 1,000 bed institution for neuropsychiatric patients; the site covers 550 acres, the group will comprise thirty-five buildings, and work will begin at once.——The Woodmen of the World have purchased 130 acres of land near New Baltimore, and will erect a sanatorium there.

New York City

Liquor Licenses Revoked.—The local district prohibition administrator's office recently revoked the liquor licenses of the following:

Dr. Onofrio Cirillo
Dr. William B. Wood
Dr. Herman L. Enselberg
Dr. Nathan Lederfriend
Dr. Glenn L. Voorhees
Dr. John Lo Pinto
Dr. Herman R. Castro
Dr. Max Bender
Dr. James E. Lee
Dr. Melchiorre Vinci
Dr. Henry S. Frintnight
Dr. James H. Potter
Dr. Evan Styles Potter

Diphtheria Trends Downward.—There were fewer cases of diphtheria in New York in the first six months of 1926 than in the corresponding period in any of the preceding five years. According to the city health department, there were 2,993 cases of diphtheria reported in the first six months of this year, while in 1921, during the same period, there were 19,472 cases; 1922 showed a great decline over the preceding year, the number of cases being 6,697. There has been a gradual decline since that time and the health department concludes that the record can be attributed in reasonable measure to the use of toxin-antitoxin.

Course in Accident Prevention.—New York University, in cooperation with the American Museum of Safety, will offer a collegiate course in accident prevention this fall which will be open to alumni of the university and students, and employees of industries which are members of the museum of safety, government officials and employees, and others who are professionally interested in accident prevention. C. W. Price, director of safety, International Harvester Company, formerly manager of the National Safety Council, M. Graham Cole, director of safety, Metropolitan Life Insurance Company, and others will assist in the instruction. This is an effort to check the increase in industrial and public accidents and is in response to a demand from all parts of the country for trained leaders in safety work.

OHIO

Health at Dayton.—Telegraphic returns to the U. S. Department of Commerce from sixty-five cities with a total population of about 29,000,000 for the week ending August 7 indicates that the lowest mortality rate (6.2) was at Dayton, and that the mortality rate for the group of cities as a whole was 10.6. The mortality rate for Dayton for the corresponding week last year was 9.6, and for the group of cities, 10.7.

Approved Tourists' Camps.—The state department of health receives inquiries daily from the traveling public for lists of approved tourists' camps, indicating that the public is learning the value of camp sanitation. There are 234 camps along the highways of Ohio which have been approved. A list of these camps was published in the July issue of *Ohio Health News,* and an appended list of camps approved since that time appears in the August 15 issue.

New Diagnostic Laboratory.—The people of Cleveland approved a bond issue last year for $375,000 to construct at the city hospital a central diagnostic laboratory. The plans have been completed and the contract will be awarded soon. The building will be just north of the present nine story general hospital; it will have two floors and a basement, and an amphitheater seating 135. It will contain a museum,

a morgue, rooms for research, five large units for technical work, and other features to make it most modern.

Licenses Revoked.—The state medical board, at a meeting July 13, revoked the licenses to practice of the following physicians:

Thomas W. Clark, Canton, and Francis A. Hopkins, Akron, were charged with unprofessional and dishonest conduct, specifically lending their name to one E. O. Shawman, an illegal practitioner who is not a physician.

Samuel F. George, Lima, who was charged with unprofessional and dishonest conduct, specifically, in the use of extravagantly worded advertisements.

L. D'Orville Chabut, Youngstown, because of his conviction of a felony; he pleaded guilty in common pleas court to criminal abortion, and was sentenced to the state penitentiary; the sentence was suspended because of his age on condition that he not engage again in the practice of medicine in Ohio.

PENNSYLVANIA

Pilgrimage of Chemists to Priestley's Grave.—The American Chemical Society will make a pilgrimage, September 5, to the grave and old home of Joseph Priestley on the banks of the Susquehanna in Northumberland, which is now preserved as a shrine of American chemistry by the alumni of Pennsylvania State College. The American Chemical Society is said to have been organized shortly after a pilgrimage of chemists to this shrine on the one hundredth anniversary of the discovery of oxygen; three of the original group survive—Samuel A. Goldschmidt, Ph.D., New York, Prof. Abram A. Breneman, New York, and Frank W. Clarke, LLD., U. S. Geological Survey, who is at present in England, and the former two chemists will be present at the September meeting. The hosts will include Mrs. Frances Priestley Forsythe, great-granddaughter of the founder of modern chemistry, the Central Pennsylvania Section of the American Chemical Society and the G. G. Pond Memorial Association, which is composed of alumni of Pennsylvania State College. A fireproof museum has been erected on the lawn of the old Priestley mansion to house a collection of Priestley's original laboratory apparatus and personal effects. The trip to Northumberland will be made by special train from Philadelphia. The ceremonies will be brief, consisting probably of each person placing a flower on the grave, and of an account by Dr. Goldschmidt of the first meeting of chemists at this place in 1874.

State Medical Meeting.—The seventy-sixth annual meeting of the Medical Society of the State of Pennsylvania will be held at the Bellevue-Stratford Hotel, Philadelphia, October 11-14, under the presidency of Dr. Harry W. Albertson, Scranton, whose address will be followed by that of Dr. Wendell C. Phillips, New York, President of the American Medical Association; other guests will include:

Dr. Aldred S. Warthin, professor of pathology, University of Michigan Medical School; Dr. Francis Carter Wood, Columbia University School of Medicine, New York; Dr. Howard T. Karsner, Western Reserve University School of Medicine, Cleveland; Dr. Francis W. Peabody, Boston; Dr. Joseph C. Bloodgood, Baltimore; Edward C. Kendall, Ph.D., University of Minnesota; Dr. Isaac A. Abt, Northwestern University Medical School, Chicago; Dr. A. Graeme Mitchell, University of Cincinnati College of Medicine; Dr. Conrad Berens, New York; Dr. George L. Tobey, Boston, and Dr. Howard Fox, New York.

Two guest speakers have been allotted to each section, and arrangements have been made for each section to show cases in the clinics. The lectures for the general public this year will be on Wednesday evening in the convention hall of the hotel, and will be followed by the president's reception. The mayor of Philadelphia, the Hon. W. F. Kendrick, and Dr. Moses Behrend, president, Philadelphia County Medical Society, will deliver the addresses of welcome. Among the many interesting and practical features of the program, comprising demonstrations, clinics, addresses and exhibits, will be symposiums on scarlet fever, encephalitis, dermatology in relation to medicine, the thyroid gland, gynecology, thoracic surgery and industrial surgery.

Philadelphia

Medicine at the Sesquicentennial Exposition.—The medical exhibit at the Sesquicentennial Exposition is organized in four grand divisions—medicine, dentistry, pharmacy and nursing—and is located in the Palace of Education on Pattison Avenue. Medicine is subdivided into (1) the prevention of contagious and infectious diseases; (2) prevention of heart and kidney diseases; (3) prevention of nutritional diseases; (4) prevention of metabolic diseases; (5) prevention of industrial diseases; (6) prevention of skin diseases; (7) prevention of nervous and mental diseases. The dental exhibit shows in comparison an old fashioned and a modern dental office, and demonstrates preventive dentistry in relation to public health. The pharmacy exhibit comprises, among other things, the fixtures and furnishings of the old Glentworth Drug Store, the various departments of a modern drug store and laboratories for making chemical and clinical tests in the standardization of biologic products. The nursing exhibit shows the history of nursing in this and other countries, and demonstrates the opportunities offered to nurses after graduation. The hygiene and sanitation exhibit comprises preschool children, school children, recreation, bacteriology, immunology, municipal hygiene, public health administration, domestic hygiene, nutrition, social hygiene, industrial hygiene and entomology. There is a tuberculosis exhibit composed of eighteen miniature stages devoted to various phases of prevention and treatment. The Interstate Dairy Council has an exhibit showing the handling and treatment of milk and its relation to health and disease. There has been erected an emergency hospital under the general direction of Dr. Wilmer Krusen, director of public health of Philadelphia, and chairman of the general committee on health and medicine at the exposition, and under the immediate charge of Dr. Joseph C. Doane, medical director, Philadelphia General Hospital; it has a capacity of ten beds, the staff is from the Philadelphia General Hospital, and its work is limited to first aid. The medical executive committee comprises Dr. William D. Robinson, Dr. David Riesman, Dr. Henry D. Jump, Emerson R. Sausser, D.D.S., Dr. William A. Pearson, George H. Meeker, Ph.D., Dr. George A. Knowles and Dr. Seneca Egbert. Talks on child hygiene have been made daily since August 19 by Albert C. Mitchell, supervisor of publicity and exhibits of the Texas State Department of Health; these are features of the children's clinic in connection with the exhibit of the children's bureau of the U. S. Department of Labor in the Transportation Building.

SOUTH CAROLINA

Dr. Beachley Resigns.—Dr. Ralph G. Beachley, who organized the Spartanburg County Health Unit in 1925 and has since been health officer, has resigned to become deputy state health officer of South Carolina, and Dr. Henry G. Callison, health officer of Newberry County, will become county health officer of Spartanburg County about August 25.

Society News.—Dr. Dove Walter Green, Mullins, was elected president of the Little Pee Dee Medical Society at its recent annual meeting at Myrtle Beach, and Dr. Hawkins K. Jenkins, Jr., was reelected secretary-treasurer. Among the speakers were Dr. Charles Frederick Williams of the state hospital, Dr. Frank H. McLeod, and Dr. Lonnie M. McMillan. Among the guests were Dr. George H. Bunch, Columbia, president of the state medical association.

TENNESSEE

Walnut Log Medical Society.—This society will meet at the Walnut Log Hotel, Reelfoot Lake, Tenn., September 21-22; all physicians in good standing in their local societies are invited to attend and become members. The society's primary object is an outing for physicians at the famous hunting and fishing grounds; a scientific program, however, has been prepared, which includes prominent men from St. Louis, Memphis, Nashville and other cities. Reelfoot Lake can be reached by good roads from Union City, Obion and Dyersburg, Tenn., and from Hickman, Ky. Arrangements for transportation from any one of these places to the lake will be made for any one who will communicate with the secretary, Dr. Robert Lyle Motley, Jr., Dyersburg, Tenn.

VIRGINIA

Typhoid Clinics.—The county health department at Whaleyville and Cypress administered antityphoid vaccine to 196 persons, July 29; clinics are held at various towns every week, and in the country, where as many as twenty persons congregate to receive the vaccine. There has been no outbreak of typhoid.

Personal.—Dr. and Mrs. Smelt W. Dickinson, Marion, celebrated their golden wedding anniversary, July 12; Dr. Dickinson has practiced medicine in Marion for forty-five years.——Dr. Bathurst B. Bagby has resigned as chief medical inspector of the bureau of health of Richmond to accept a position as health officer of the city of Athens and Clarke County, Ga., and will take up his new duties, September 1.——Dr. John S. Horsley, Jr., has been placed in charge of the department of plastic and thoracic surgery at St. Elizabeths Hospital, Richmond.——Dr. Henry S. Daniel, Jr., has been elected mayor of Louisa, to complete the unexpired term of the late George S. Johnson.

Decline in Birth Rate.—There were 8,840 fewer births in Virginia in 1925 than in 1921, the loss being in the ratio of 5,934 white and 2,906 colored children. The first half of the year 1926 shows a further loss to the state in births of 2,072 as compared with the same period last year; in the former years, the loss was larger among the white population, but in the first three months of 1926, this was reversed, the white loss in that period being 6.1 per cent of the 1925 white total for the same period, and the colored loss 11 per cent of the 1925 colored total. The state board of health states that to study this situation carefully the vital statistics must be complete and strenuous efforts are being made to secure accurate registration of every birth. Parents have become interested in birth registration. There are, however, from fifty to a hundred physicians who are negligent in reporting, and some of them have been fined. "Mothers' certificates" are now required for entrance to the public schools. These are mailed to mothers within four months after a birth is recorded; if any mother has no certificate for a child who enters school this fall, she should write to the bureau of vital statistics, Richmond.

HAWAII

Funds for Research.—The Rockefeller Foundation has contributed to the University of Hawaii $20,000 a year for five years, according to *Science*, as a special research fund for the study of the biologic, mental and social characteristics of the people of Hawaii.

No Liquor Licenses Revoked.—In replying to a request for the names of physicians whose liquor licenses have been revoked in Hawaii, the district prohibition administrator replied that the liquor permits of no physicians in the territory had been revoked up to the present time.

GENERAL

Osler Memorial Volume.—The Osler Memorial Volume, published under the auspices of the International Association of Medical Museums, and reviewed in THE JOURNAL, August 7, may be secured from the managing editor, 836 University Street, Montreal, at $10 a copy.

Alumni News.—The second annual meeting of the Ensworth-Central Medical College Alumni will be in St. Joseph, Mo., at the St. Francis Hotel, Wednesday evening, October 13, during the Kansas City Fall Clinical Week. Dr. Charles G. Geiger, president of the alumni association, will be the host; all graduates and professors are cordially invited.

Report of Committee of Health Officers.—The Conference of State and Provincial Health Authorities of North America, at its recent annual meeting, Atlantic City, adopted the report read by Dr. Mathias Nicoll, Jr., chairman of the committee on relations between medical men and health officers. A copy of this report has been received by the speaker of the house of delegates of the American Medical Association for reference to that body.

American Pharmaceutical Association.—This association will hold its convention at the Bellevue-Stratford Hotel, Philadelphia, September 13-18; there will be addresses of welcome by Mayor Kendrick of Philadelphia; Dr. Wilmer Krusen, director of public health; Dr. Moses Behrend, president, Philadelphia County Medical Society, and Joseph W. England, president, Pennsylvania Pharmaceutical Association. Surg. Gen. Hugh S. Cumming, U. S. Public Health Service, Sir William Glyn-Jones, former member of the British Parliament, and Frank T. Stone, Washington, D. C., president of the National Association of Retail Druggists, will speak. There will be a picnic in the country adjacent to Philadelphia, a dinner, reception and ball at the Bellevue-Stratford, and a day at the exposition.

Meeting at Woods Hole.—There will be a meeting, August 28, at the Marine Biological Laboratory, Woods Hole, Mass., a luncheon served at the club and a trip on the laboratory launch *Cayadetta* for a discussion of ways and means of (1) securing all the scientific literature of the world and making it available for the scientists in this country; (2) placing this material where it is most needed, and (3) informing the scientists of the location of this material. It has been proposed that the discussion be made concrete so that the meeting may lead to results; that suggestions for cooperative action be made and that the possibility of arranging for another meeting be considered at the time of the annual session of the American Medical Association, or at the time of the American Library Association meeting.

Pullman Porters All Vaccinated Against Smallpox.—*Health News*, published by the New York State Department of Health, quotes the director of the department of sanitation and surgery of the Pullman Company to the effect that before a negro is employed by the Pullman Company as porter, he must be vaccinated or show evidence of a recent successful vaccination. The physician making the examination must satisfy himself that the scar is less than 5 years old, and if older, the applicant for employment must be reinoculated. There are about 12,000 negroes employed by the Pullman Company as porters. In this connection, we are reminded of an editorial, published in THE JOURNAL, July 22, 1922, which stated that "in this day of rapid intercommunication, it is well to recall that smallpox was introduced into Montreal in 1885 by an unvaccinated Pullman car porter." In the epidemic that followed, there were about 15,000 cases and 3,164 deaths.

American Hospital Association.—The twenty-eighth annual convention of the American Hospital Association will be at Atlantic City, N. J., September 27-October 1. There will be a special train from Chicago with a day's stop-over at Washington; the fare is the convention rate of a fare and a half with no extra charges. Reservations may be had from the managing editor, Hospital Management, 537 South Dearborn Street, Chicago. The program for this meeting will center around two factors: (1) the extension and adaptation of hospital aid to the whole community, and (2) the conservation of the people's contribution through the strictest kind of economy in every phase of hospital construction and administration. There will be foreign delegates from Great Britain, China, Panama, Australia, the Philippines, Hawaii, Porto Rico and other places. The exhibits on the steel pier will comprise educational and scientific exhibits and technical equipment and supplies. There will be a reception, entertainment and dancing Tuesday evening, arranged by the New Jersey Hospital Association and the department of the institutions and agencies of New Jersey. The headquarters of the American Hospital Association for this meeting will be at the Hotel Chalfonte-Haddon Hall.

FOREIGN

Low Record of Fatalities on British Trains.—The extremely small risk in traveling on trains in Great Britain is indicated in a report in the New York *Times*, which states that only one passenger lost his life during 1925 as the result of railway accidents, among the millions of passengers who travel yearly on British trains. In two previous years—1908 and 1901—it is said that not a passenger was killed on British railways. The history of railroading in Great Britain shows comparatively few fatalities, only one in 1909; six in 1924, and three each in 1916 and 1919. There was an accident in 1915, in which it is said, 224 members of a troop train were killed. The low record of fatalities is attributed to the large number of safety appliances in use, the excellent signal system, and to great care generally throughout the system.

Personal.—A dinner in honor of Dame Mary Scharlieb, M.D., was arranged by the London branch of the Medical Women's Federation in July. The *British Medical Journal* quotes that "at 81 she is still operating with unimpaired judgment and skill."——Dr. Mañes, Madrid, is the official delegate from Spain to the International Dental Congress at Washington this month.——Dr. M. Treub, Amsterdam, is president of the newly organized commission for combating rheumatism in the Netherlands. It expects to collect data in regard to rheumatism throughout the country, open consulting dispensaries, and plan for intensive study of rheumatism in some special hospital.——Dr. Wilfred Watkins-Pitchford, director, South African Institute for Medical Research, will shortly retire from active work on account of ill health; he was appointed director in 1921, and in 1916 became chairman of the Miners' Phthisis Medical Bureau, and was, for years, a member of the Natal Medical Council.——Dr. James R. C. Greenless has been apointed head master of Loretto School, Glasgow, Scotland.——Dr. Allan Watt was recently presented with a walnut escritoire and a check on the occasion of his recent retirement from practice in Strathaven, Scotland, after forty-one years.——Dr. T. Heynemann, dean of the medical faculty of the University of Hamburg, announces that a prize will be given for research leading to the construction of a respiration-calorimeter for infants. Competition is restricted to German physicians and medical students.——Dr. C. Schilling of the Institute for Infectious Diseases at Berlin has been elected a member of the malaria commission of the League of Nations.——The *Bruxelles médical* relates that Dr. J. Cantacuzène, professor of experi-

mental medicine, University of Bucharest, met with a serious accident in a Swiss railroad station, losing both his legs.——Dr. Bravo Frias, director of the Madrid Institución de Puericultura, has been awarded the municipal prize for his study of infant mortality in Madrid.——Prof. von Rothe is in charge of the institute for medical motion pictures recently installed at the Charité hospital, Berlin.——The prize offered by the *Archivos Españoles de Pediatría* has been awarded to Dr. A. Arguelles Terán, Madrid, for his work on "Masked Forms of Scurvy in Children."

Government Services

Compensation for Veterans with Arrested Tuberculosis

In the closing days of Congress, legislation was passed awarding $50 a month to ex-service men who have had tuberculosis to a compensable degree which has since been arrested. This legislation was enacted in response to requests of the American Legion and other soldier organizations; they contended that the soldier who once had tuberculosis of a compensable degree was thereafter less robust than previously and that the government should recognize the fact by providing compensation in all such cases. Testimony was presented before the house committee having this legislation in charge to show that ex-service men suffering from tuberculosis were compelled to return again and again to Veterans' Bureau hospitals, even though the disease responded favorably to care and treatment and in many cases the patients were adjudged to have had the tuberculosis "arrested."

Prior to the passage of this new legislation, the soldier with arrested tuberculosis was deprived of all compensation when the medical authorities reported his case under that classification. Now the Veterans' Bureau at Washington has issued regulations definitely fixing the policy of the bureau with regard to this award to ex-service men. The regulations provide that a statutory award of not less than $50 shall be granted, after physical examination of the applicant by a board of three physicians, two of whom shall be physicians of special training in tuberculosis. "Complete arrest" of tuberculosis, which are the words of the statute, is defined in these regulations to mean

compliance with the definition of arrested tuberculosis in the Schema for Classification approved by the American Sanatorium Association and adopted by the bureau, Nov. 8, 1892; that is, the beneficiary must have shown no constitutional symptoms of tuberculosis for six months; and the expectoration over the same period must have shown bacilli absent; the physical signs must be those of a healed lesion, and the roentgen findings must be compatible with the physical signs.

A statutory award of not less than $50 will be granted, without such physical examination, when the records of the Veterans' Bureau in individual cases show

a characteristic clinical course of formerly active tuberculosis that is now arrested, as, for example, where there has been a period of hospitalization for active tuberculosis with eventual discharge from hospital as "arrested," and where there has been no change in condition since discharge though six months has elapsed since arrest was reached—a rating assigning the statutory award will be made upon the evidence in file.

In all other types of arrested cases the board of physicians will make reexaminations, and when it cannot be settled whether "arrested" is present, or when, from physical examination and study of case records, the board fails to determine the actual existence of previous tuberculosis, the beneficiary will at once be referred, through the regional medical officer, to the nearest suitably equipped hospital to clear these questions. Such hospital shall preferably be a U. S. Veterans' Bureau hospital, although other government hospitals may be utilized by the regional office. The regulations provide that in the last mentioned cases all available clinical and laboratory methods, including roentgen-ray examination, shall be employed in this determination. The staff shall at such hospitals thereafter make a written report as to whether or not true tuberculosis has been shown to exist. The regulations then provide for methods of observation and study of each individual case by the staff of such hospitals to determine whether or not the applicant is entitled to the award.

It is estimated that approximately 26,000 ex-service men will be the beneficiaries of this legislation, and that the cost to the government will be $11,231,000.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Aug. 7, 1926.

Lunacy Reform

In July, 1924, in consequence of public dissatisfaction arising out of certain cases, a royal commission on lunacy was appointed to inquire into the existing law and administrative machinery in connection with the certification, detention and care of persons who are, or are alleged to be, of unsound mind and to consider the extent to which provision should be made for the treatment without certification of persons suffering from mental disorder. A report of far-reaching importance has just been issued. The commission sat for forty-two days, and more than a hundred witnesses attended, including thirteen who had previously been inmates of institutions. The commissioners state that there is no clear line of demarcation between mental illness and physical illness. The distinction is commonly based on a difference of symptoms and is in practice no doubt convenient, but it has had an undue influence on the development of the lunacy system. The modern conception of mental illness calls for a complete revision of the attitude of society in the matter of its duty to the mentally afflicted. The keynote of the past has been detention, the keynote of the future should be prevention and treatment; but the crucial difficulty is that the special nature of the symptoms of mental illness must in many cases necessitate restraint. Every facility should be afforded to the mentally ailing to submit voluntarily to treatment; but when compulsory detention is unavoidable the intervention of the law should be as unobtrusive as possible and should secure that the patient's liberty is not infringed longer or to a greater extent than his symptoms necessitate in his own or the public interest. In particular, emphasis is laid on the need for providing facilities for the treatment of incipient mental disorder without the necessity of certification, which should be the last resort in treatment and not (as is now too commonly the case) the prerequisite of treatment. The commission has come to the conclusion that the present safeguards against wrongful certification, if properly observed, are adequate. Reference is made to the reluctance of physicians to be involved in the certification of the insane owing to liability to actions at law. The commission finds that the medical profession is undertaking this duty with increasing reluctance and reports that unless some relief is found for the situation without delay a breakdown in the system is inevitable. It accordingly makes recommendations designed to secure further protection for physicians. With regard to detention, after considering the evidence of former patients and after interviewing many patients now under care in institutions, the commission reports that in none of the cases which it investigated was it satisfied on the evidence that improper detention had been suffered. It states that the general evidence which it received on the subject was reassuring. Instances of sane persons being wrongfully certified or improperly detained must be of the rarest occurrence.

The following is a summary of the principal recommendations:

CERTIFICATION, AND TREATMENT WITHOUT CERTIFICATION

1. The lunacy code should be recast so that the treatment of mental disorder should approximate as nearly to the treatment of physical ailments as is consistent with the special safeguards indispensable when the liberty of the subject is infringed. Certification should be the last resort and not a necessary preliminary to treatment. The procedure for cer-

tification should be simplified, made uniform for private and rate-aided cases alike, and dissociated from the Poor Law.

2. Facilities for the treatment of voluntary boarders should be increased, particularly by their admission to public psychopathic hospitals.

3. In the case of an involuntary patient, if there is a prognosis of early recovery, facilities should be provided for treatment without certification for a period of from one to six months under a provisional treatment order.

4. Involuntary patients requiring full certification should be the subject of a reception order made by a judicial authority on two medical certificates.

5. Physicians should receive additional protection. Further attention should be given to mental science in the medical curriculum; and local authorities should be empowered to appoint a certifying physician for their area.

DETENTION

1. A visitor of the board of control should visit every institution and every patient in single care at least twice a year.

2. Local visiting authorities, in addition to the periodic visits already prescribed, should visit at least once a month for the purpose of seeing new patients and their admission documents.

3. Local authorities should be empowered, subject to the approval of the board of control, to make provision for the after-care of patients.

4. The power of a petitioner to direct the discharge of a patient should be subject to further limitation. The duty of health officers in charge of public psychopathic hospitals should be made explicit to apprise the appropriate authority of the recovery of any patient.

5. Special steps should be taken to classify convalescent patients, so that they may receive the sustained observation of the medical superintendent.

CARE

1. Voluntary unofficial visitors of suitable experience should be appointed by the authorities of psychopathic institutions.

2. Notices should be posted in every ward setting out the rights of patients in regard to correspondence and interviews. Letter boxes should be provided in the wards and other suitable places, and opened only by one of the senior officers.

3. For the future, psychopathic hospitals should be designed to accommodate not more than 1,000 patients, and the villa system should be adopted.

Malaria Research in England

The report on the first results of laboratory work on malaria in England, just published, by Col. S. P. James and Mr. P. G. Shute, contains much new and valuable information. The use of infected mosquitoes in the treatment of general paralysis has afforded an opportunity of studying the conditions governing infection. Pure stains of the benign tertian parasite were used, with *Anopheles maculipennis* as the vector. Of 2,630 female mosquitoes used, 530 were found ultimately available for infection of 145 patients, of whom 109 developed the disease. The mortality of *A. maculipennis* kept in artificial "tropical" conditions at 24 C. was high—about 50 per cent during each seven to ten days of life. At 22 C. it was less, but the time taken to become infected was longer, and fresh feeds of blood were needed daily or every other day. If a temperature of 26 C. was maintained with a view to obtaining quick infection, nearly all the mosquitoes died before the salivary glands contained sporozoites; that is, before they became infective. At a low temperature, such as 4 to 6 C., infected mosquitoes lived up to two and one-half months and retained their infectivity. These facts may explain the absence of new cases during very hot seasons, and also, since the oocysts are arrested in development but not killed by the low temperatures, the recrudescence of cases in the spring. Only a small number of persons who suffer from malaria were found infective to *Anopheles*. Some with induced malaria were not infective at any period of their course, and the strikingly infective patient was a rarity, while repeated feeds on an infected patient were needed to infect the mosquito. As this occurred under the most favorable artificial conditions, it is thought probable that "95 per cent. of potential malaria-carrying mosquitoes will never play that rôle." It is concluded that much antimalarial work is wasted effort. It also seems that malaria does not spread unless a number of special conditions are fulfilled, and is probably to a large extent a "household" disease and should therefore be dealt with in houses more than environment. Interesting differences were found between the classic description of benign tertian malaria and the induced disease. The incubation period was usually twelve days, but in many it was ten days; it might be as short as seven or as long as twenty-three. The course is divisible into three stages. In the initial stage, lasting from two to five days, there was gradually increasing irregular fever, remittent at first, intermittent later but without rigors. In the second, or developed stage, in 80 per cent of cases there was for ten days or more a quotidian fever with daily rigor, even if infection had been conveyed by a single bite. In the third stage the type of fever changed from quotidian to tertian. The parasites were not as a rule found in the peripheral blood till the second or third day of fever. In a second attack from a new infection, even after a prolonged interval, the temperature was of the true tertian periodicity. If, therefore, a patient showed a typical tertian temperature from the start, this indicated inquiry as to a history of previous malarial attacks. In the treatment of general paralysis, a rigor on alternate days was followed by greater benefit than a daily rigor. The objective was usually attained by allowing the primary attack to continue for four or five days, then giving from 3 to 5 grains (0.2 to 0.3 Gm.) of quinine to bring about a temporary check, and waiting for a relapse. The temperature then was nearly always of the true tertian character, with rigors on alternate days.

PARIS

(From Our Regular Correspondent)

Aug. 4, 1926.

The Fiftieth French Congress for the Advancement of Science

At this time of year, when the Academy of Medicine and all the learned societies are on vacation, and also large numbers of the physicians, the scientific life is manifested only in the provincial congresses. Lyons was this year the meeting place of the Congress for the Advancement of Science, which, for the last fifty years, has met annually, during the month of August, in some large city. This congress comprises a large number of diverse sections, including a great variety of branches of learning. The medical section did not present a large number of papers, the congress following so closely the "journées médicales" held in Paris, which was marked by an important display of new inventions. Some of the medical papers, however, have a very particular interest. Professor Hugounenq, honorary dean of the Faculty of Medicine of Lyons, sought to explain the laws of heredity by purely physicochemical phenomena—a serious problem under all circumstances but which has become still more troublesome since the appearance of the works of Yves Delage and of Bataillon, who have demonstrated that the impregnation of the ovum in certain species can be accomplished without the action of the spermatozoon, solely through the influence of chemical agents. Hugounenq discussed in this connection the micella of the ovular nucleus. In his opinion, the chemical nature of the molecules is not the essential thing. Hereditary characters are dependent on the varying relations

of the molecules to one another, by which different assemblages are constituted. Thus, molecules which are chemically identical but which are grouped in diverse manners constitute different colloids, and, consequently, dissimilar natures. In other words, hereditary influences are the immediate function of the division of the elements, and they have more of a physical than a chemical basis.

Several papers on the technic of radium treatment of cancer and on the roentgen-ray treatment of cutaneous and cutaneomucous cancers are deserving of mention; in fact, the communications on roentgenologic subjects were the most important presented in this section. The paper by Jacques Risler attracted considerable attention. Developing the ideas of Zwardemaeker on the radioactivity of potassium in the blood, he showed that potassium and its salts were especially susceptible to the action of chemical radiations of the sun. Insolated potassium chloride has enabled us to obtain rapid photographic impressions. This establishes the connection between a number of biologic phenomena and the physical influences that are brought to bear on the terrestrial globe. The sun and the radioactive elements of long wave lengths act on the metals contained in the organism and bring them a powerful but variable amount of energy.

More Prompt Aid for Automobilists

The enormous development of automobile traffic along rural highways, which includes tourist cars and commercial trucks, has brought about a frightful increase in the number of accidents, which have now reached a much higher figure than those caused by the railways, even as the result of serious catastrophes. The number of fatal accidents occurring in France now exceeds three a day, while the number of more or less serious accidents, though not fatal, is twenty times as great. Every Monday morning, the newspapers devote half a column to a recital of the accidents occurring the day before; for Sunday, when the conditions are favorable for tourist traffic, produces regularly more fatal accidents than any other day in the week. Almost all these accidents occur in the rural sections, far from inhabited regions; for it is well known that many automobilists, when supervision by the authorities is removed, indulge in speeding, and then, too, in the rural sections, also the farmers with their horse-drawn vehicles pay little attention to traffic regulations. The result is that on the country highways the victims of accidents frequently suffer for want of medical care and treatment, especially if, as often happens, the automobile is demolished or put temporarily out of service by the accident. And even if the contrary is true, there are cases in which the injured person cannot be transported by ordinary means and must first be cared for by a physician, which may necessitate the application of a suitable appliance. In that event, the injured person may be compelled to rely on the kindness of other automobilists who happen along. But such neighborly kindness is becoming more and more the exception, for considerable fear and distrust have been awakened by the fact that recently a group of bandits conceived the idea of simulating an accident. Some of the bandits lay down in the road as if they had been injured, planning thus to induce passing automobilists to stop to render them assistance. When would-be Samaritans stopped their car, the bandits rose from the ground and, together with their companions concealed by the roadside, attacked them, revolvers in hand, and robbed them.

Consequently, various plans are being considered for the organization of some means of providing prompt assistance to travelers who are injured along rural highways. The most recent proposal, which has attracted considerable attention, is that presented by Dr. Vincent of Aix-les-Bains, who is a general practitioner in a mountainous region much frequented by tourists, in which accidents are exceedingly numerous during the summer season. Dr. Vincent has suggested that in each of the 36,000 communes of France a first-aid station be established in some public building—that is to say, in some place where some one would be on duty at all times, even Sundays. At each station there would be a first-aid outfit, including one or two splints for the immobilization and transport of fractured limbs (of the very practical type invented by Professor Rouvillois) and three packages of so-called individual surgical dressings of the type used during the war by the army medical corps, containing aseptic gauze and cotton, water-proof silk, a surgical bandage and safety pins; also, in a special box, the necessary material for temporary hemostasis, a supply of antiseptics, ampules for hypodermic injections (ether, camphorated oil, epinephrine, etc.). The material would be inspected and renewed from time to time by a physician of the locality. An automobile would be always ready, in a garage of the commune, to be dispatched for the injured person and to transport him, after he had been given first aid, to the physician of the neighborhood or to the nearest hospital. As there is, in almost every commune, a committee of the Red Cross Society, such a committee would doubtless be able to furnish a representative to care for such service, at least on Sundays. In case, at the time of the accident, no physician should be available in the locality, it would be his duty to go to the aid of the injured person. In communes having a hospital, the first-aid station would, of course, be located there.

When an accident takes place along the highway, the first cyclist or automobilist who gets knowledge of it will need only to inform the first-aid station of the next commune that he passes through. The expenditures for the dressings and the towing of the automobile would be charged to the injured person, and would usually be paid by some insurance company. In this manner, the equipment of the first-aid station could be constantly renewed. The original cost of the first-aid outfit would be about 700 francs. The municipal council of each commune would have to make that primary outlay. That would amount to more than 25,000,000 francs for the whole country, and, owing to the present stringent financial conditions, it does not seem likely that this excellent project can be carried out in all the communes, in the immediate future. The plan has, however, received the endorsement of the medical associations of the country. These associations are making great efforts to induce the minister in charge of the telephone and telegraph service to reverse his ruling prohibiting Sunday service of these public utilities. It is thought that such a concession would at least improve the situation with reference to Sunday automobile accidents.

A Regrettable Incident

Dr. André Colin, who is an eminent specialist in the mental diseases of children and who conducts a course in the pedagogy of physiology at the University of Paris, has recently reported an unusual experience. He had been delegated to study a number of children who were backward in their school work and gave evidence of early viciousness. The children attended a public school in Suresnes, a suburb of Paris, where the population was made up, in large part, of factory workers. His examination of the children led him to conclude that most of them were heredosyphilitic. He recommended therefore to the municipality to establish a dispensary for the care of such children, where they could be given a series of injections, the nature of which he did not divulge, in order not to violate the right of privileged communication. He commissioned Dr. Tobolowska, a woman physician and one of his pupils, to give the injections (of arsphenamine, as it developed later). One or two slight accidents occurred, whereupon the principal of the school, who took offense at the intrusion of strangers in connection

with the care of his pupils, filed a complaint with the prefect of the Seine against Dr. Tobolowska, whom he accused of performing dangerous experiments with the children. The parents of the pupils, whom the principal had no difficulty in arousing, joined in the complaint. A judicial inquiry was opened into the conduct of the woman physician, which involved also Dr. Colin indirectly. Expert witnesses were summoned and the inquiry dragged along for several months, the municipality of Suresnes defending the woman physician and the dispensary that she established. The court recently rendered its decision, which exonerated Dr. Colin and Dr. Tobolowska and set forth that the prescribed treatment was justified and in conformity with the present status of medical science. The prefect of the Seine thereupon removed from office the principal of the school, who had been the author of the regrettable incident.

GENEVA

(From Our Regular Correspondent)

Aug. 7, 1926.

Temperance and Total Abstinence

The temperance movement in Switzerland is of Protestant origin, but the Catholics very soon associated themselves with it. Mgr. Egger in 1895 founded, with the help of Dr. P. A. Ming, the Swiss Catholic League against alcoholism, which at first included moderates and total abstainers. The Catholic total abstainers' league has developed in a very encouraging manner. The Catholic bishops have repeatedly associated themselves with the fight against alcoholism; in 1908 by a collective letter against absinthe; again, in 1923, they issued an appeal for the substitution of free distilling by the extension of monopoly. Since the famous meeting in September, 1877, when the Protestant pastor Louis Rochat of Geneva founded the temperance society of the Blue Cross, the pastors have always occupied a considerable place in this and other organizations. The proportion of abstainers in the free churches is probably greater than that in the national churches though, year by year, the members of the state churches who rally to the temperance cause are more numerous. The Protestant churches are in favor of the fight against alcoholism, but total abstinence and direct entry of the churches into the struggle meet with less enthusiasm. The Swiss churches dislike to enter directly into political and social struggles.

Prizes for Works on Venereal Disease

The French National League against the Venereal Peril offers three prizes as follows: (1) 5,000 francs to the author of the best work on "The Hereditary Syphilitic Psychopathies in Children and Adolescents and Their Influence on Juvenile Criminality." (2) 5,000 francs to the author of the best study on "The Association of Syphilis and Tuberculosis in Osteo-Articular Affections (Pathogenesis, Diagnosis and Treatment.") (3) 20,000 francs to the author of the most important discovery in the domain of venerology during the years 1926 and 1927.

The conditions for the two first prizes (the manuscripts to be anonymous) are: The manuscript must be in French and must never have been published; it must be not only a general review of the subject, but, above all, original work pertaining to new data. Three typed copies, with an index to each, must be sent. Each manuscript must be accompanied by a sealed envelop containing an epigraph with the name and address of the author. The envelops will be opened after the decision of the jury has been made known. The manuscripts for these two prizes are to be sent directly to the office of the league, 44, Rue de Lisbonne, Paris (VIIIe) before Oct. 1, 1928. One of the three copies of the paper will be returned to the author after the decision of the jury has been made public. The league may favor the publication of the papers presented.

For the third prize (20,000 francs), if the jury does not consider any of the discoveries presented worthy, the prize will not be awarded. However, the prize may be divided between the authors of the two best contributions to the subject. The prizes will be awarded in December, 1928.

Life Insurance Periodic Medical Examinations

Following the practice of certain life insurance companies in the United States and England, a continental company, "Vita" by name, began first in Switzerland and subsequently in Belgium, to offer gratuitous periodic medical consultations for its policyholders. Any one carrying a policy of 30,000 francs or over can consult a physician of his choice every three months. He goes to his physician with an order from the company, and the physician informs the company that he has examined the policyholder at the date stated on the company's order, especially in respect of the heart, lungs, blood pressure and urine (sugar and albumin) and has given him all necessary advice. The physician includes his bill, and he and the policyholder sign it together. The company pays this bill, but should treatment be required or the advice of a specialist needed, these are paid for by the policyholder.

Eosinophilia in Neoplastic Disease

Dr. T. Cavour, a former assistant at the Surgical Clinic of the University of Geneva, has been working on eosinophilia in malignant neoplasms. He examined the blood of forty subjects with tumors, benign and malignant. In thirty-two cases of malignant growths, eosinophilia was found in only eleven (34.4 per cent) ranging between 4, 5, 5.5, 6.6 and 10 eosinophils for each hundred white cells. In eight cases of nonmalignant growths, six presented eosinophilia varying between 3.5 and 4 per cent—otherwise, 75 per cent of the cases. There exist many hypotheses—sometimes contradictory—in respect of the function of the eosinophils. Cavour says that the nucleus of the eosinophil, which stains poorly with nuclear reagents, as well as its protoplasm filled with refrangent granulations, are features identical with that of a degenerated cell. But, as Audibert has pointed out, a poor affinity of the nucleus for nuclear stains is also encountered in normal cells. As long as chromatolysis and pyknosis are absent, degeneration does not exist in the cell. Hence, Cavour believes that eosinophilia is not a degenerated element of the blood but represents a living entity elaborating its acidophil granulation. Audibert supposes that the granulations maintain the chemical equilibrium of the blood. The phase of convalescence from infectious processes is accompanied by an intense and favorable eosinophilia. The eosinophils complete the success of the struggle and reestablish the normal reaction of the blood. They are of undeniable clinical value as an element in prognosis. In chronic processes, neoplasms for example, eosinophilia appears at the onset of the process and subsides during the phase of cachexia. The conclusions are briefly that eosinophilia is a defensive action of the organism against certain toxic substances elaborated by neoplastic cells; it has no absolute symptomatologic value in cases of malignant growths, because it is encountered in nonmalignant tumors, in intoxications and in cutaneous affections. Eosinophilia decreases or completely disappears in the last phase of the evolution of the neoplasm (cachexia). Its absence may serve as an element in prognosis.

Pellagra in Switzerland

A case of pellagra that has been under observation at the dermatologic clinic of the University of Geneva is the first case reported from Switzerland. A woman, aged 44, addicted to alcohol, had lesions appear on the hands in early May, 1925. There was acute stomatitis with marked desquamation

of the mucosa, and acute superficial inflammation of the vulva with perivulvar and perianal erosions. The labia majora and minora were red and swollen, the internal surface of the minora being covered by a diphtheroid membrane. The dorsal aspect of the hands and interdigital spaces was red and congested, and presented an acute, painful dermatitis. The patient was fairly corpulent, with a somewhat earthy complexion and very apathetic. The pulse was 120; the heart sounds were normal. She complained of colic diarrhea. The tendon reflexes were sharp. The pupils were equal and reacted well to light and in accommodation. The Wassermann reaction was negative. During the second half of May the lesions on the hands improved, and on June 6 they were practically healed. The diarrhea and tachycardia continued. The psychic disturbances became aggravated, the patient at times presenting a true state of mental confusion and several times manifesting suicidal tendencies. June 14, the patient was transferred to the Bel-Air Asylum for the Insane, where it was noted that she walked with difficulty but was calm and made the remark that she was not insane. The patient willingly replied to questions, although in an indirect way, and incoherently. Her memory was greatly impaired, and her appreciation of space and time was impaired. Emaciation and physical decay progressed, and death took place, November 7.

RIO DE JANEIRO

(From Our Regular Correspondent)

July 15, 1926.

Arsphenamine Accidents

Dr. Silva Araujo recently submitted to the National Academy of Medicine some statistics collected in the venereal dispensaries. Up to Aug. 31, 1925, when an inquiry was made in Brazil as to accidents caused by neo-arsphenamine, 308,185 injections had been given in the dispensaries located in the federal district and the various states. Only two deaths were discovered that could be attributed to arsphenamine. From Sept. 1, 1925, to April 30, 1926, 73,117 injections were given in the federal district with no fatal outcome. The result shows, then, one death for each 191,000 injections.

Trophodynamic Theory

Prof. Pimenta Buena has explained at the National Academy of Medicine the fundamentals of the trophodynamic doctrine of function. The biologic equation of life depends on the material constitution of the living creature and environmental factors. The organism is born, lives, becomes sick and dies through the cell. Pimenta Buena's research has enabled him to establish these principles: All structures supplied by the same arterial trunk act as a unit against the other organs even if, among themselves, antagonistic to one another. All local hemic relations are controlled by the separate resistance of each organ, and, therefore, by the individual susceptibility of each organ.

Cardiovascular Syphilis

Dr. G. Londres, in discussing cardiovascular syphilis before the Medical and Surgical Society, pointed out that a historical review shows that at first the only syphilitic lesions studied were cutaneous and mucous. Only much later was attention given to the visceral changes. The rôle of syphilis in cardiovascular diseases received first attention at the hands of Ricord in 1845. The contributions of Lancini, Morgagni and Paré hardly dealt with any but late manifestations. Fournier, however, studied the early changes in the pulse. Even now, a number of authors dwell on the rarity of early changes in cardiovascular syphilis. In Brazil, however, the subject has been studied by a few investigators, such as Clark and Austregesilo, and more recently by da Cunha, who is in charge of the visceral syphilis service at the Gaffrée-Guinle Foundation. Londres described two cases of primary syphilitic pericarditis and the start of the secondary stage. Leredde is wrong in stating that tachycardia is rare in the secondary stage. At the Gaffrée-Guinle Foundation, a rapid pulse is common, reaching as high as 120. This is so typical that when patients present themselves with a healed chancre, and the other signs are not definite, the presence of tachycardia is accepted as a probable sign of secondary manifestations.

Gyganthorincus giga Infection

A case of infestation by *Giganthorincus giga*, a parasite of the pig, was reported to the Medical and Surgical Society recently by Dr. B. Figuereido. A girl, aged 16 years, expelled two male and two female worms, after treatment. The patient suffered from pronounced anemia and all the usual signs of helminthiasis. The disturbances included gastro-intestinal upsets, pain in the stomach, vomiting, restlessness and insomnia. A microscopic study of the feces showed blood and elastic muscular fibers. All symptoms disappeared after the worms were expelled. Dr. G. Gonzaga has found *Gyganthorincus giga* eggs twice among 1,326 fecal examinations.

The Solar Plexus in Membranous Enterocolitis

According to Dr. E. Meirelles, speaking before the National Academy of Medicine, so-called membranous enterocolitis is caused by changes in the solar plexus. Any undue sensitiveness of this structure may start a mucorrheic condition either through direct enterogenous or paraenterogenous pathways. The initial cause may lie in a vagotonic condition or endocrine deficiency. Brain and spinal troubles may also be the underlying factor.

Surgical Treatment of Chronic Glaucoma

The treatment of chronic glaucoma and the significance of this question in Brazil was recently discussed by Dr. G. de Andrade before the National Academy of Medicine. The chronic form of disease is unusually prevalent among the colored people. In the eye service of the General Policlinic, out of 351 patients with chronic glaucoma, 222 were colored and only 129 white, while among 369 with acute and subacute glaucoma, 253 were white and only 116 colored. Lagrange's "fistulizing" method and its modifications have fulfilled their promise. Andrade has tried extensively the three chief methods: those of Lagrange, whose assistant he was in Bordeaux in 1914, of Holth and of Elliot. Elliot's trephining awoke many hopes at first, but later results cooled the earlier enthusiasm, as the frequency of subsequent complications became apparent.

BERLIN

(From Our Regular Correspondent)

July 31, 1926.

The Use of Amalgam for Dental Fillings

Professor Stock, director of the chemical institute of the Emperor William Academy in Dahlem, reported recently on a chronic case of mercurial poisoning that he developed during a twenty-five year period of laboratory work, from which he concludes that amalgam fillings in teeth are injurious to health. The Berlin Gesellschaft für Zahnheilkunde organized a special session for the consideration of Stock's article.

Professor Stock opened the discussion by calling attention to Kussmaul's book, which appeared in 1861, and which dealt with mercurial poisoning occurring in employees of mirror workshops, and with mild habitual mercurialism. The fear of poisoning from metallic mercury has now been forgotten, as grave industrial mercurial poisoning has disappeared. The symptoms of mild mercurialism have, therefore, been little known of late. For twenty years rhinologists had been unable to relieve Stock of the nervous manifestations of mild mercurialism, since they sought the cause of the

disturbance in the nose. Two years ago, the cause of the condition was found to lie in the mercury content of the air of the laboratory, for, with proper measures, he obtained relief. The air of the laboratory which contained from 0.001 to 0.01 mg. of mercury to 1 cubic meter of air, when breathed for long periods, sufficed to produce mercurial poisoning in Stock and all of his associates. Since the publication of his observations, Stock has received letters from chemists and manufacturers confirming his experiments. Geheimrat Kolle in Frankfort-on-the-Main reported to Stock a case of mercurial poisoning that was caused by amalgam fillings in teeth. These fillings, which have been used in dentistry for more than fifty years, comprised formerly copper amalgam, then later silver amalgam. Whereas the copper amalgam is marketed ready-made, the silver amalgam is prepared by the dentist. The better the dentist is, the less mercury he will employ. Copper amalgam is particularly dangerous, since it decomposes readily and then contains visible globules of mercury. Stock recommended, against violent opposition, that amalgam fillings be removed, because a person suffering from mercurial poisoning is sensitive to small quantities of mercury. Stock cited the case of the Marburg physiologist who had grave symptoms of mercurial poisoning, whose health markedly improved after the removal of the copper amalgam fillings from his teeth. Stock found that good silver amalgam fillings yield only small quantities of mercury, but that poor fillings yield a large amount. He found that the same was true of old amalgam fillings, which are supposed to be harmless. Microscopically, silver amalgam fillings show much unevenness. To be sure, the fillings are covered by saliva, so that in the mouth vaporization is impossible, ordinarily; but laboratory experiments have shown that mercury in dental fillings is exceedingly volatile, and after several decades suffices to cause poisoning. A recent experiment showed that a person who has had silver amalgam fillings in his teeth for a period of three years expired a slight quantity of mercury. There is no essential difference between copper and silver amalgam, although the latter is less dangerous, being slower to act. Stock wants physicians—and especially rhinologists and neurologists—to establish whether neurasthenic and catarrhal conditions may not be traced to bad amalgam fillings. He holds that amalgam fillings should be removed if neurasthenic or catarrhal conditions develop for which the physician can find no cause. Stock suggested that a substitute for amalgam fillings be sought.

In the discussion that followed, Professors Dieck, Schönbeck and Schröder, of the university dental institute, said that the dangers of amalgam fillings had been known for a long time. Experiments, which, however, have not been completed as yet, indicate that amalgam fillings give off mercury only for a few days after they have been applied. Stock, it was asserted, had generalized too much from personal experience and had not taken sufficient account of idiosyncrasies. Professor Schultz, neurologist, stated that a statistical inquiry would be unreliable because neurasthenics were eager to discover some new affection in themselves and would report symptoms of mercurial poisoning if the suggestion was given them. Professor Heller, dermatologist, likewise called attention to the importance of individual disposition in the use of mercury as a therapeutic agent and stressed the fact that mercurial poisoning was almost unheard of when mercury was used along with arsphenamine. There must be, therefore, special but still unknown defense substances in the body. Professor Bruck, laryngologist, referred to the fact that otologists and rhinologists were in the habit of using strong solutions of mercuric chloride for long periods without harm resulting. Professor Joachimoglu, pharmacologist, stated that diagnosis of mercurial poisoning should not be on the basis of symptoms, but on the presence of the poison. Arsenous oxide would produce the same toxic symptoms as mercury. At a session of the Berlin medizinische Gesellschaft, held later, Professor Stock repeated his address; here, too, his conclusions were vigorously opposed.

Increase of Typhoid Fever

Owing to the impairment of the public health service during the war and the postwar period, resulting from various causes; more particularly, on account of the reduction in public appropriations and the lack of health officers, there has been a considerable increase of typhoid over the prewar period. In the majority of cases the source of the epidemics has been the dairies rather than the water supply. The epidemic that developed recently in a small town of the free state Lippe was traced to cheese sold in a grocery, typhoid bacilli having been found in the product. The cheese had been made in a neighboring dairy.

Epidemic in the Flooded Area of Upper Silesia

In a flooded area of the Oder River and its tributaries, in the government district of Breslau, there has been recently an outbreak of a peculiar affection, the cause of which is still uncertain. The disease begins with a rather high fever, and is attended with severe pains in the muscles, a marked feeling of lassitude, attacks of headache, and other symptoms of a severe infection. The temperature reaches sometimes 40 C. (104 F.). The ordinary duration of the disease is five days. Cases have not resulted fatally as yet. Thus far, 250 cases have been reported. Preliminary researches indicate that an insect is the cause of the infection. The disease is said to resemble Papatacci fever, which Austrian physicians have studied in the Adria region. The persons affected with the disease have been living, for the most part, in close proximity to the flooded and afterward swampy meadows. A similar outbreak occurred in the same region, in 1903.

Sentence Imposed on a Professional Faster

The activities of a professional faster in Berlin have inspired imitators in several other cities, and recently one of them was unmasked. Investigation revealed that he was not confining himself to cigarets and water, as was alleged, but was taking, daily, chicken broth, "pepsin wine," "biomalt" and candies. As the result of the exposure, the whole gang was brought to trial. The alleged faster received a penitentiary sentence of ten weeks, while his manager was imprisoned for four months and forced to pay a fine of 400 marks. The man who was ostensibly serving as guard was given a light sentence of one week. The charge brought against the culprits was "getting money under false pretenses." It is thought that this summary action will put an end to such public exhibits.

Marriages

McKINLEY HOMER CRAIG, Leonard, Texas, to Miss Mildred Frances Richardson of Honey Grove, July 4.

VINCENT J. SHIPPY, Pulaski, Wis., to Miss Josephine Slupinski of Green Bay, June 29.

LOUIS PETER HINIKER, St. Paul, to Miss Elizabeth B. Sullivan of Minneapolis, in June.

ALBERT GOTTLIEB GUMM to Miss Margaret Blau, both of Paris, Ill., June 12.

LOUIS A. FRIEDMAN to Dr. Della May Weintraub, both of New York, July 1.

LEO MERRILL HENIKOFF to Miss Dorothy Cooper, both of Chicago, June 27.

ROY MARK GREENTHAL to Miss Jean Mack, both of Milwaukee, July 7.

Deaths

Thomas Hayden Hawkins, Plainfield, N. J.; Bellevue Hospital Medical College, New York, 1873; member of the Colorado State Medical Association; emeritus professor of surgery, University of Colorado School of Medicine; formerly dean, professor of gynecology, abdominal surgery, and midwifery, and president of the board of trustees, Gross Medical College, Denver; at one time on the staffs of the National Jewish Hospital for Consumptives, St. Anthony's, Mercy and the City and County hospitals, Denver; aged 78; died, July 20, of cerebral hemorrhage.

Ancil Martin ✠ Phoenix, Ariz.; Rush Medical College, Chicago, 1885; past president of the Arizona State Medical Association and the Maricopa County Medical Society; member of the American Academy of Ophthalmology and Oto-Laryngology; formerly secretary of the Arizona State Board of Medical Examiners; on the staff of St. Joseph's Hospital, where he died, August 4 of acute nephritis, aged 65.

Frederick Samuel Mandlebaum ✠ New York; Bellevue Hospital Medical College, New York, 1889; member of the American Association of Pathologists and Bacteriologists; past president of the New York Pathological Society; formerly on the staff of Mount Sinai Hospital; aged 59; died, August 7, following a long illness.

Burnley Lankford ✠ Norfolk, Va.; University of Virginia Department of Medicine, Charlottesville, 1903; member of the American Association of Obstetricians, Gynecologists, and Abdominal Surgeons; on the staffs of the Protestant and King's Daughters hospitals; served during the World War; aged 46; was drowned, August 3.

Charles Murray Adams, Williamsport, Pa.; Bellevue Hospital Medical College, New York, 1888; member of the Medical Society of the State of Pennsylvania; past president of the Lycoming County Medical Society; formerly on the staff of the Williamsport Hospital; aged 67; died, recently, of pneumonia.

William Rawlings ✠ Sandersville, Ga.; University of Maryland School of Medicine, Baltimore, 1875; past president of the Washington County Medical Society; formerly member of the state legislature; proprietor of the Rawlings Sanitarium, where he died, August 1, aged 75, of septicemia.

Henry Welsh Wickes ✠ Surgeon, U. S. Public Health Service; University of Maryland School of Medicine, Baltimore, 1892; was appointed assistant surgeon in 1894, and commissioned surgeon in 1910; aged 57; died, July 20, at Columbia River Quarantine, Astoria, Ore.

Saxton Temple Pope ✠ San Francisco; University of California Medical School, San Francisco, 1899; assistant professor of surgery at his alma mater; past president of the San Francisco County Medical Society; aged 50; died, August 8, of lobar pneumonia.

John Warren Achorn ✠ Pinebluff, N. C.; Medical School of Maine, Portland, 1887; Bellevue Hospital Medical College, New York, 1889; member of the Massachusetts Medical Society; aged 69; died, August 5, at his summer home in Annisquam, Mass.

Mead Moore ✠ Washington, D. C.; George Washington University Medical School, Washington, 1906; member of the American Academy of Ophthalmology and Oto-Laryngology; aged 60; died, August 3, at his summer home in Gloucester, Mass.

Henry C. Ruhl, Leipsic, Ohio; Pulte Medical College, Cincinnati, 1894; member of the Ohio State Medical Association; formerly mayor of Leipsic, and for many years county physician of Putnam County; aged 61; died, August 7, at Detroit, of heart disease.

Franklin Abbott Dorman ✠ New York; Medical Department of Columbia College, New York, 1898; formerly on the staffs of the New York Post-Graduate, New York City, Woman's, and Sloane hospitals; aged 53; died, August 6, of heart disease.

William Townes Jones, Ware Shoals, S. C.; Medical College of the State of South Carolina, 1876; member of the South Carolina Medical Association, formerly member of state legislature; aged 73; died, July 22, following a long illness.

William Charles Wermuth ✠ Chicago; University of Illinois College of Medicine, Chicago, 1889; formerly on the staffs of the Grant, Francis Willard, Passavant and Ravenswood hospitals; aged 63; died, July 27, of heart disease.

Helen Elizabeth Hinton, Shreveport, La.; Tulane University of Louisiana School of Medicine, New Orleans, 1922; member of the Louisiana State Medical Society; aged 37; died, August 7, at the Touro Infirmary, New Orleans.

Robert Bartholow Cunningham ✠ Cadott, Wis.; Louisville (Ky.) Medical College, 1894; University of Louisville School of Medicine, 1898; aged 54; died, July 4, at St. Joseph's Hospital, Chippewa Falls, of chronic nephritis.

Ira J. Dawson, Somerville, Texas; University of Tennessee College of Medicine, Memphis, 1905; member of the State Medical Association of Texas; aged 52; died, June 25, at Cameron, following an appendectomy .

Edwin Boyle McAllister ✠ Terre Haute, Ind.; Rush Medical College, Chicago, 1894; past president of the Vigo County Medical Society; aged 58; died, August 8, at the Union Hospital, of cerebral hemorrhage.

Albert Ernest Westbrook, Ashley, Ohio; Cincinnati College of Medicine and Surgery, 1863; member of the Ohio State Medical Association; also a druggist; Civil War veteran; aged 85; died, August 6.

J. A. Griffin, Clayton, N. C.; College of Physicians and Surgeons, Baltimore, 1881; member of the Medical Society of the State of North Carolina; aged 71; died, August 3, of acute dilatation of heart.

Nelson A. Ryon, Bowie, Md.; Howard University School of Medicine, Washington, D. C., 1883; bank president; aged 67; died, August 1, at the Emergency Hospital, Washington, D. C., of nephritis.

Louis Martin Kridel, Pittsburgh; University of Pennsylvania School of Medicine, Philadelphia, 1919; member of the Medical Society of the State of Pennsylvania; aged 30; was drowned, August 8.

John G. Ames, Chicago; University of Maryland School of Medicine, Baltimore, 1881; member of the Illinois State Medical Society; aged 73; died, July 28, at Tulsa, Okla., of angina pectoris.

Thomas M. Rice, Avoca, Ark.; Missouri Medical College, St. Louis, 1882; member of the Arkansas Medical Society; aged 71; died, July 23, at a sanatorium in Hot Springs National Park.

William Elmer Mercer ✠ Liberty, Ill.; Keokuk Medical College of Physicians and Surgeons, 1906; also a druggist; formerly postmaster of Liberty; aged 48; died, August 2, of heart disease.

Alfred Harvey Black ✠ Thomaston, Ga.; Tulane University of Louisiana School of Medicine, New Orleans, 1891; aged 57; died, July 27, at a hospital in Atlanta, following an operation.

William Randall Brigham, Dublin, Ga.; University of Georgia Medical Department, Augusta, 1897; member of the Medical Association of Georgia; aged 52; died, July 29.

Samuel L. Brooksher, Fort Smith, Ark.; University of Louisville School of Medicine, 1894; member of the Arkansas Medical Society; aged 58; died, July 13, at Turkey.

Delmer Clayton Tripp, Hopewell Junction, N. Y.; Bellevue Hospital Medical College, New York, 1875; aged 78; died recently, of carcinoma of the cecum and bladder.

Jonas Stewart, Anderson, Ind.; Long Island College Hospital, Brooklyn, 1870; Civil War veteran; aged 83; died, August 4, of acute cystitis and rectovesical fistula.

Fred R. Berry, Kansas City, Mo.; University of Kansas School of Medicine, Rosedale, 1906; aged 51; died, August 2, of chronic interstitial nephritis and myocarditis.

Charles D. Baker ✠ Rohrersville, Md.; University of Maryland School of Medicine, Baltimore, 1881; formerly a druggist; aged 69; died, August 2, of heart disease.

Russell James Dougherty, Englewood, N. J.; Jefferson Medical College of Philadelphia, 1925; aged 26; died, July 23, at Englewood Hospital, of septicemia.

Theodore Wright Clark, Everett, Mass.; University of Vermont College of Medicine, Burlington, 1892; member of the school board; aged 69; died, July 22.

Samuel J. McGrew, Shelbyville, Tenn.; University of Pennsylvania School of Medicine, Philadelphia, 1881; aged 71; died suddenly, July 19, of heart disease.

Julius Henry Hoelscher ✠ Chicago; Chicago Medical College, 1885; aged 62; died, July 23, at his summer home at Trout Lake, Wis., of heart disease.

Frederick M. Townsend, New York; Medical Department of Columbia College, New York, 1879; aged 70; died, August 5, following a long illness.

James W. West ✙ Purcell, Okla.; University of Arkansas Medical Department, Little Rock, 1901; aged 55; died, May 18, following an operation.

George Daniel Walker, Erie, Pa.; University of the South Medical Department, Sewanee, 1906; aged 47; died recently, of uremia and chronic nephritis.

James Francis O'Brien, Bellows Falls, Vt.; University of Vermont College of Medicine, Burlington, 1900; aged 51; died, July 4, of heart disease.

Andrew Quigg Young, Moreland, Ga.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1887; aged 61; died, July 24, of chronic nephritis.

Charles Diedrich Van Romondt, Pompton Plains, N. J.; Medical Department of Columbia College, New York, 1872; aged 79; died, August 5.

Walter Raleigh Barnesby, Jr., Washington, D. C.; George Washington University Medical School, Washington, 1907; aged 54; died, August 5.

Edgar Ormsby Mitchell, Newburgh, N. Y.; Medical School of Harvard University, Boston, 1892; aged 62; died, June 26, of cerebral hemorrhage.

Ida Wright Rogers, Chicago; Hahnemann Medical College and Hospital, Chicago, 1884; aged 66; died, July 31, of hypostatic pneumonia.

Harry Clayton Will ✙ Chicago; Northwestern University Medical School, Chicago, 1892; aged 60; died, August 16, of cerebral hemorrhage.

Franklin Pierce Barnd, Hegins, Pa.; Jefferson Medical College of Philadelphia, 1897; aged 58; died recently, of cerebral hemorrhage.

Alonzo D. Smith, Venice, Calif.; Medical Department of Columbia College, New York, 1867; aged 85; died recently, of cerebral hemorrhage.

Jack Henry Grant, Covington, Ky.; Medical College of Ohio, Cincinnati, 1895; served during the World War; aged 54; died, August 5.

Thomas J. Kelly, Mount Pleasant, Mich.; Saginaw Valley Medical College, 1902; aged 54; died, August 1, of valvular heart disease.

William Jay Harrer, Utica, N. Y.; Baltimore University School of Medicine, 1886; aged 61; died, March 4, of cerebral hemorrhage.

George Schott ✙ Sioux City, Iowa; Missouri Medical College, St. Louis, 1882; aged 68; died, July 4, of carcinoma of the throat.

Michael P. Finnegan, Minneapolis (licensed, Minnesota, under the Act of 1887); aged 86; died recently, of diabetic gangrene.

Charles Alexander Chambers, Dunkin, Texas (licensed, Texas, under Act of 1908); aged 72; died recently, of paralysis.

Charles Donald Pomeroy, Ogdensburg, N. Y.; Bellevue Hospital Medical College, New York, 1883; aged 62; died, July 31.

Elwin De Witt Robbins, Nashua, N. H.; Michigan College of Medicine and Surgery, Detroit, 1896; aged 64; died, July 23.

Joseph Rufus Smith, Orangefield, Texas; Memphis Hospital Medical College, 1902; aged 45; died recently of pneumonia.

James A. Denney, Chicago; Physio-Medical Institute, Cincinnati, 1879; aged 69; died, July 20, at Santa Monica, Calif.

Howard Douglas Fritz, St. John, N. B.; McGill University Faculty of Medicine, Montreal, Que., 1888; died, in May.

Clarence Greesy Green, Beaver City, Neb.; Jefferson Medical College of Philadelphia, 1888; aged 64; died, May 22.

Robert Percival Jensen, Long Beach, Calif.; Creighton Medical College, Omaha, 1896; aged 51; died, July 31.

Eliza H. Patton, Cleveland; Cleveland-Pulte Medical College, 1906; aged 54; died, August 4, of heart disease.

James S. Quinn, Preston, Ont., Canada; Queen's University Faculty of Medicine, Kingston, 1909; died, in May.

Cora E. Cary Talbott, Portland, Ore.; Hahnemann Medical College and Hospital, Chicago, 1882; died, in July.

Jonathan H. Bennet, Farmersburg, Ind.; Eclectic Medical Institute, Cincinnati, 1872; aged 82; died, June 4.

Walter P. Mitchell, Middletown, Ind.; Rush Medical College, Chicago, 1886; aged 64; died, July 2.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE JOURNAL'S BUREAU OF INVESTIGATION, OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER GENERAL MATERIAL OF AN INFORMATIVE NATURE

THE SAN-GRI-NA AND SILPH CHEWING GUM FRAUDS

Some Obesity Cures Declared Frauds by the Government

Readers of certain newspapers and popular magazines have for some time past been regaled with the advertisements of what, apparently, were two obesity cures, but which seem to have been, in fact, one. One of the cures was sold as "San-Gri-Na" and was put out by the imposingly-named "Scientific Research Laboratories" and "Madame Elaine." The laboratories were non-existent and so was "Madame Elaine." The other obesity cure was "Silph Chewing Gum," which was sold by the "Silph Medical Company" and "Madame Claire." There was nothing medical about the company; there was no "Madame Claire."

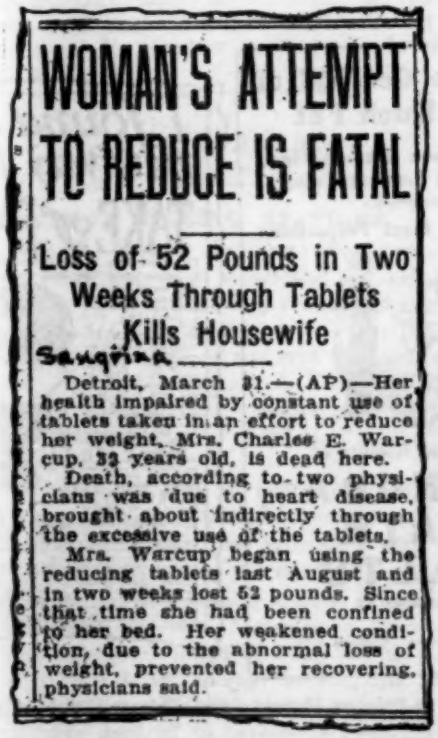
The San-Gri-Na fraud was analyzed in the A. M. A. Chemical Laboratory in 1924 and an article published on the subject in THE JOURNAL of November 22 of that year. A briefer report on the same humbug appeared in *Hygeia*, May, 1925. One of the chief advertising assets of the San-Gri-Na fraud was a testimonial by Dr. J. J. Rudolph, a "former health commissioner." J. J. Rudolph lives at 636 Garden Street, Hoboken, New Jersey. He is the same J. J. Rudolph, apparently, that exploited a quack cure for malaria a few years ago known as "Dr. J. J. Rudolph's Antiplasma," sold as a "positive cure" for that condition. For some reason not very obvious, J. J. Rudolph is a member of the Hudson (N. J.) County Medical Society, a member of the Medical Society of New Jersey, and through that has qualified as a Fellow of the American Medical Association.

The facts, as brought out by government investigation and reported by Judge Horace J. Donnelly, Solicitor for the Post Office Department in a memorandum to the Postmaster General recommending the issuance of a fraud order against these fakers, show that both San-Gri-Na and Silph Chewing Gum are enterprises of one W. E. Learned, who had for a manager C. F. Callan. The Scientific Research Laboratories had for its address 1841 Broadway, New York City; the Silph Medical Company was at 9 West 60th Street. These were two entrances to one building, the same offices being used in the operation of both enterprises. There was a marked similarity in composition between San-Gri-Na and Silph Chewing Gum; both contained pokeroot, leptandrin, phenolphthalein and desiccated thyroid, and both, according to the government report, were made by the H. K. Mulford Company of Philadelphia.

In addition to these two obesity cure fakes, Learned had two subsidiary humbugs in the same line: "Dr. Folt's Reducing Soap," which the federal chemists reported was an artificially colored soap made largely from palm oil or a similar fat, and containing a minute amount of iodine in the form of water-soluble iodides, and "Sangra Salts," which was Epsom salt colored. Learned evidently meant to overlook no opportunity of catching those optimistic overweights who think they can reduce without cutting down on the food intake or increasing the amount of exercise. He covered the four methods at present popular in the obesity cure field: tablets for internal administration, reducing soap, reducing chewing gum and reducing bath salts. Seven ounces of Epsom salt that could be purchased for a few cents in any drug store, brought a dollar and a half when sold as an obesity cure by Mr. Learned under the name "Sangra Salts."

The copy of the memorandum of the Solicitor to the Post Office Department to the Postmaster General recommending the issuance of a fraud order, brings out some interesting

details regarding this case. Not the least interesting is the fact that one of the attorneys who appeared for these quacks was William H. Lamar of Washington, D. C., a former solicitor of the Post Office Department, and a man who should be and doubtless is thoroughly familiar with the tricks of medical mail-order swindlers. Mr. Lamar had associated with him in this case Mr. E. M. Jeffrey. Messrs. Lamar and Jeffrey attempted to becloud the issue by confining the defense of their client to a technical consideration of the statutes. It appears that very shortly after Learned had been served with copies of the memorandum of the government charges against him, such as is always done in cases of this kind, this quack hurriedly modified his advertising claims; at least, such modifications were claimed by his attorneys, Lamar and Jeffrey. On the basis of these alleged modifications, these attorneys argued that, as their client had abandoned his "old literature," the Postmaster General was deprived of jurisdiction. However, as Judge Donnelly points out, at the very time of the hearing when these technicalities were being



WOMAN'S ATTEMPT TO REDUCE IS FATAL

Loss of 52 Pounds in Two Weeks Through Tablets Kills Housewife

Sangrina

Detroit, March 31.—(AP)—Her health impaired by constant use of tablets taken in an effort to reduce her weight, Mrs. Charles E. Warcup, 33 years old, is dead here.

Death, according to two physicians was due to heart disease, brought about indirectly through the excessive use of the tablets.

Mrs. Warcup began using the reducing tablets last August and in two weeks lost 52 pounds. Since that time she had been confined to her bed. Her weakened condition, due to the abnormal loss of weight, prevented her recovering, physicians said.

At least one woman lost her life from the use of "Sangrina."

raised, the old advertisements were appearing in current magazines that were on the news-stand. Advertisements from *True Story* magazine, *Picture Play* magazine and *Hearst's International Cosmopolitan* were brought by the government as evidence in the case showing that as late as May and June, 1926, these magazines were carrying advertisements for some of Learned's fakes. To quote a few extracts from the solicitor's memorandum to the Postmaster General:

"The business being operated under the names Scientific Research Laboratories, Sangrina Company, W. E. Learned, and Madame Elaine will be first described. This business consists in the sale through the mails of tablets known as 'San-Gri-Na,' a soap known as 'Dr. Folt's Soap' and bath salts known as 'Sangra Salts,' each for the cure of obesity. . . . The answer alleges that these tablets [San-Gri-Na] are manufactured by the H. K. Mulford Company of Philadelphia, Pa., in accordance with the following formula:

Solid Extract Phytolacca	1 grain
Potassium Bitartrate (Cream of Tartar)	2 grains
Sulphur	2 grains
Leptandrin	1/16 grain
Phenolphthalein	3/32 grain
Desiccated thyroid	3/32 grain

"It will be observed that the above formula indicates that each tablet weighs 5¼ grains. The evidence shows that an analysis of San-Gri-Na tablets, reported in THE JOURNAL of the American Medical Association in 1924, gave the following results:

The tablets weigh 6½ grains each.		
Sulphur	2.1	grains per tablet
Cream of Tartar	1.14	grains per tablet
Vegetable extractive and undetermined	1.0	grain per tablet
Calcium carbonate	.7	grain per tablet
Arrowroot starch	.7	grain per tablet
Talc	.3	grain per tablet
Moisture	.2	grain per tablet
Phenolphthalein	.1	grain per tablet

"This analysis did not show iodine in any form or thyroids. A sample of San-Gri-Na tablets, examined by chemists in the Bureau of Chemistry, United States Department of Agriculture, showed the following:

Tablets weigh 6.3 grains each.		
Sulphur	1.92	grains per tablet
Cream of Tartar	1.26	grains per tablet
Phenolphthalein	.13	grain per tablet
Thyroid material	.14	grain per tablet
Ext. Phytolacca (Plant Extractive)	.17	grain per tablet
Leptandrin (Alcohol Soluble)		
Calcium Carbonate	.74	grain per tablet
Talc	.23	grain per tablet
Starch (Potato) moisture, adhesive matter and undetermined by difference	1.72	grains per tablet

"It will be observed that, while the formula claims that each tablet weighs 5¼ grains, the first analysis above quoted showed that the tablets weigh 6½ grains, and the second 6.3 grains each.

"There is in evidence a copy of a letter from the H. K. Mulford Company to the Scientific Research Laboratories, dated February 1, 1926, wherein the following statements were made:

For your records since changing the formula of your San-Gri-Na tablets eliminating thyroid and substituting bladderwrack, our private formula department is now manufacturing San-Gri-Na tablets beginning with formula No. 36440 as follows:

Solid Extract Phytolacca	1 grain
Potassium Bitartrate	2 grains
Sulphur	2 grains
Leptandrin	1/16 grain
Extract Bladderwrack	¼ grain
Phenolphthalein	3/32 grain in each tablet

Up until private formula No. 36440 we used 3/32 grain Desiccated Thyroid which has now been changed to Extract Bladderwrack ¼ grain as stated above.

"A further letter in evidence from the H. K. Mulford Company to Mr. E. F. Callan of the Scientific Research Laboratories, dated February 18, 1926, showed that the tablets were being manufactured with bladderwrack instead of thyroid. A telegram from the H. K. Mulford Company to Mr. Jeffrey of counsel in this case, dated May 6, 1926, in evidence, reads as follows:

Order for San-Gri-Na tablets containing bladderwrack was canceled only experimental tablets delivered. San-Gri-Na tablets have always contained thyroids.

"In the second Mulford letter, above referred to, Mr. Callan was advised that the substitution of bladderwrack in the place of thyroids in the San-Gri-Na tablets will give equally satisfactory results 'without producing palpitation, extreme nervous irritability, etc., occasionally attendant where evidence of hyper-thyroidism exists.' From this correspondence, it appears that the promoters of this enterprise were informed by their manufacturing chemists that the administration of thyroid by their tablets might be attended with harmful results."

The memorandum then quotes some of the advertisements for San-Gri-Na and comments on the advertisements thus:

"The evidence shows, and I so find, that the representation in the first above quoted advertisement, to the effect that San-Gri-Na is a new French discovery, is false and fraudulent. The evidence before me shows that the ingredients in the San-Gri-Na preparation have long been known in the medical profession, and that there is nothing new in this combination. The evidence shows that the 'Madame Elaine,' referred to in the advertisement, is an employee of the promoters of this scheme, her true name being Helen Masten.

"The representation that 'no matter how fat you are or how many things you have tried before, now you can be relieved' is a false pretense. The promoters of this scheme well know that there are other preparations similar to San-Gri-Na on the market. Their own preparation Silph Chewing Gum, sold under the name of the Silph Company from a different street address from that employed in the sale of San-Gri-Na, is practically the same preparation as San-Gri-Na. Persons who have tried that preparation and found it worthless would be induced by this representation to try San-Gri-Na.

"The story respecting 'Madame Elaine,' set forth in the above advertisement, has been eliminated from the proposed so-called 'new' literature. The representation that there is something secret or mysterious respecting the San-Gri-Na preparation is false.

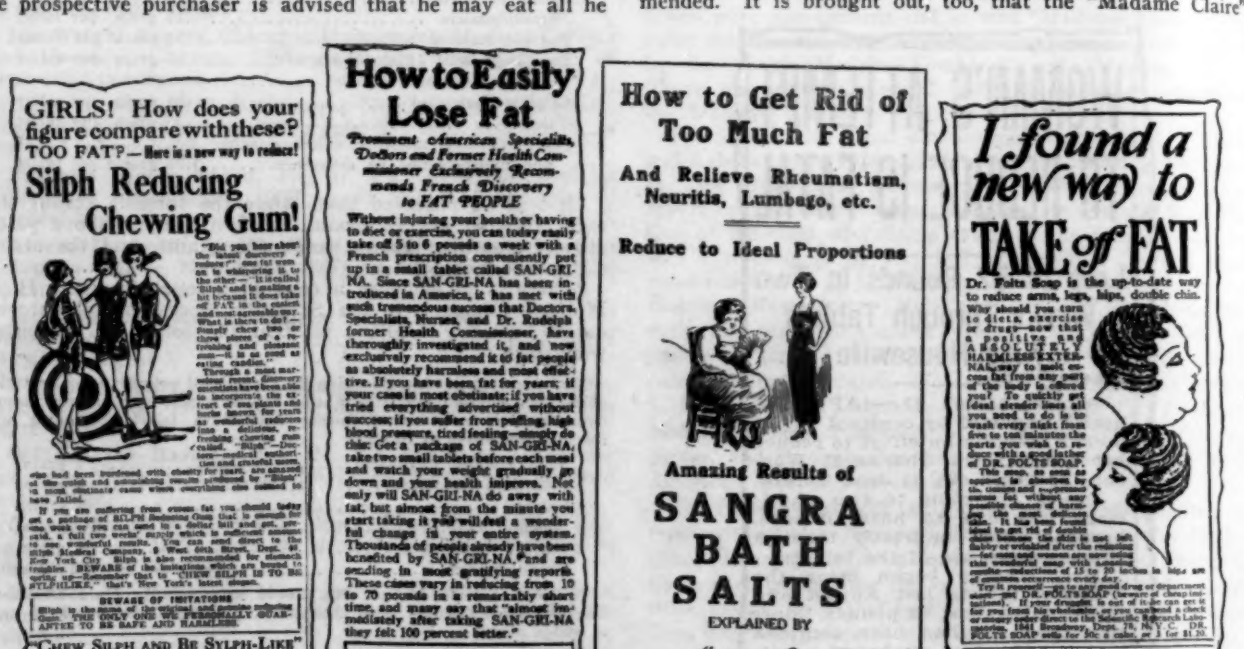
"Purveyors of anti-fat cures seek to fill a demand from the lazy, obese public for some simple preparation to remove fat, without any effort on the part of the sufferer incident to strict diets, change of habit and exercise. They realize that the ordinary obese person likes to eat and that such persons abhor diets. Accordingly, in their advertising and literature, the prospective purchaser is advised that he may eat all he wants. In the above quoted advertisements, he is cautioned against 'weakening' himself with diets and tiring himself with exercises.

"However, after the fat person purchases San-Gri-Na he finds enclosed in the package of tablets a little booklet containing, among other things, 'General Instructions' as to the treatment. He is first told to clean out the bowels thoroughly using 'Veritables French Laxative Pellets' sold by the Sangrina Company for two days before starting the San-Gri-Na. He is also told to use these Pellets regularly two or three times a week thereafter. He is cautioned not to use any other laxative, as these pellets 'will not interfere with the ingredients in 'San-Gri-Na.' This representation is calculated to deceive in that the pellets consist of aloes and cascara, ordinary laxatives, well known to laymen. Other ordinary laxatives universally used could be taken by persons taking San-Gri-Na without interference with the ingredients of that preparation. The obese person who has purchased San-Gri-Na on representations that the taking of the treatment is 'simple' and 'easy' also discovers in the 'General Instructions' accompanying the package that upon awakening in the morning he should take a full glass of warm water in which he is to squeeze the juice of one lemon."

Following this, the memorandum discusses briefly the other two fakes, Sangra Salts and Folt's Soap, and then takes up for consideration Silph Chewing Gum: the Solicitor shows that the only difference between Silph Chewing Gum and San-Gri-Na is the trade name and a slightly different formula. The formula for Silph Chewing Gum, as admitted by Learned was:

Solid Extract Phytolacca	½ grain
Extract Bladderwrack	1 grain
Extract Leptandrin	1/16 grain
Pepsin	1/16 grain
Pancreatin	1/16 grain
Thyroid	⅛ grain

It, of course, contained chicle and sugar as a base. Although the stuff admittedly contained thyroid, the solicitor's memorandum brings out the fact that an advertisement for Silph Chewing Gum appearing in magazines for May, 1926, contained the statement: "Does not contain thyroid or any dangerous drug." The memorandum brings out further that, while the Silph Chewing Gum advertising declares that it is unnecessary for the purchaser to diet, yet after the preparation has been purchased, the victim finds that a diet is recommended. It is brought out, too, that the "Madame Claire" to whom prospective purchasers were urged to write, did not exist.


GIRLS! How does your figure compare with these?
TOO FAT?—Here is a new way to reduce!
Silph Reducing Chewing Gum!
BEWARE OF IMITATIONS
"CHEW SILPH AND BE SYLPH-LIKE"
How to Easily Lose Fat
Prominent American Specialists, Doctors and Former Health Commissioner Exclusively Recommends French Discovery to FAT PEOPLE
How to Get Rid of Too Much Fat
And Relieve Rheumatism, Neuritis, Lumbago, etc.
Reduce to Ideal Proportions
Amazing Results of
SANGRA BATH SALTS
EXPLAINED BY
Madame Elaine
I found a new way to TAKE off FAT
Dr. Folts Soap is the up-to-date way to reduce arms, legs, hips, double chin.

Reproductions (greatly reduced) of typical advertisements of "San-gri-Na," "Silph Reducing Chewing Gum," "Sangra Bath Salts" and "Dr. Folt's Soap."

From the standpoint of business morality and the responsibility of publishers to the public, it is worth noting the fact brought out in connection with this scheme to defraud, that both San-Gri-Na and Silph Chewing Gum were advertised in about 400 newspapers and magazines. Further, that out of the gross receipts of one-half a million dollars—$500,000—which Learned took in annually, he expended over $300,000 in advertising. Once more it should be emphasized that the newspaper and magazine publisher of easy advertising virtue makes more money out of defrauding the public in medical swindles than the medical swindlers themselves, and yet runs absolutely no risk of legal reprisal. The solicitor's memorandum closes thus:

"At the time the citations in these cases were delivered by the Postmaster at New York, N. Y., namely, April 2, 1926, that official reported that approximately 1,500 pieces of mail were being delivered daily to the names employed in the Silph business, and a like number were being delivered to the names employed in the San-Gri-Na scheme.

"The evidence before me shows, and I so find, that the schemes being operated under the names set forth in the caption hereof are ones for obtaining money through the

mails under false and fraudulent pretenses, representations and promises.

"I therefore recommend that a fraud order be issued against the names set forth in the caption hereof."

On June 24, 1926, fraud orders were issued against the Scientific Research Laboratories, Sangrina Company, W. E. Learned, Madame Elaine, Silph Medical Company, Silph Company, Madame Claire, and their officers and agents as such. It will be interesting to see whether any of these frauds—"San-Gri-Na," "Sangra Salts," "Folt's Reducing Soap" or "Silph Reducing Gum"—will continue to be sold through the drug stores of the country. Legally, there is nothing to prevent this means of evading the government's action. Obesity cure swindlers cannot be attacked under the Food and Drugs Act, because obesity is not looked upon as a disease, and, therefore, products sold for the treatment of obesity do not come within the scope of law's definition of drug. But even if obesity cures fell within the scope of the national Food and Drugs Act, the exploiters of these fakes would still be perfectly safe from prosecution if they did as most "patent medicine" fakers do—confined their lying claims to newspaper advertisements and circulars and said as little as possible about the product itself on or in the trade packages.

Correspondence

COLON FILLING STATIONS

To the Editor:—Chicago has long been regarded by "twilight zone" practitioners as a lucrative and well protected hunting ground. Now we are being visited and exploited by the "colon therapists." During the last two years, New York, Boston, Philadelphia, Pittsburgh and even Baltimore have had their colonic "sewers" catheterized, irrigated and bug-implanted. Now Chicago must take its place in the ranks of the "autointoxicated," the "pepless," the "bugless" and the "pale and pasty."

"Colonic therapy" has had an interesting and not unenlightening history. The Metchnikoff "chemists" gave it birth, but not until Sir Arbuthnot Lane fostered it with the vivid fanaticism of a "Billy" Sunday did the "poisonous cesspool" of man parade in accepted medical society. The disappointments that followed the myriad resections, "short-circuits" and entro-anastomoses advocated by Lane and his co-workers permitted this "new birth" therapy to languish, and up to three years since, the defenseless colon—to whose vagaries all ailments from dandruff to pernicious anemia have been ascribed—secured a well merited rest.

But not for long: a New York Turkish bath attendant took up the gage, "invented" a special steel table, and devised an assortment of "colon tubes" of length sufficient to irrigate all the way from Dan to Beersheba, if necessary. And, of course, tables, tubes and modus operandi were available to all who had the cash and who wished to embark on the career of "colon therapist."

The ex-Turkish bath rubber, overnight, became a "Professor," established in Gotham an elaborate "colon laundry," circularized the reputable medical profession with a costly brochure (filled with pictures and pseudo-scientific rubbish), and gave "courses" in the art of "cesspool" drainage.

It is needless to say that, among the chiropractors and the osteopaths, "colon therapy" came as "manna in the desert." At present, on our Eastern littoral, no "up-to-date" cultist is without the ex-Turkish bath "Prof's" table, tubes and sweet-smelling "lavage fluid."

Until recently, Chicago's rich field has been left untilled; now "The Chicago Institute for Colonic Therapy" is in our midst, with a full equipment of "special apparatus and colon tubes," "freshly prepared broth cultures of *Lactobacillus acidophilus*," a "consulting radiologist" and the promise to its less fortunate (or adventurous) medical brethren to treat all "in a strictly ethical manner" and "return cases to the physician, when anything except colon therapy is required. All this information neatly printed in gold and blue on first quality bristol board and mailed free to those of us who are not up to date in the sciences and the arts.

This "new" colon therapy rests on no basis of fact, is employed by none of the country's leading gastro-enterologists, and is permitted in no institution of recognized standing. But, Chicago must fall in line as a "progressive" and have its "Institute." Barnum was right!

FRANK SMITHIES, M.D., Chicago.

EPIDEMIOLOGY OF POLIOMYELITIS

To the Editor:—From time to time the possibility of milk-borne epidemics of poliomyelitis has been considered. In corroboration of statements made in the article by Dr. Aycock (THE JOURNAL, July 10), I wish to report the analysis of sixty cases of poliomyelitis handled by the Los Angeles County Health Department in 1925. There were thirty-two males and twenty-eight females, with ages as follows:

MALES		FEMALES	
Under 1 year	2	Under 1 year	2
1- 3 years	13	1- 3 years	12
4- 7 years	10	4- 7 years	5
8-15 years	4	8-15 years	8
16-20 years	3	16-20 years	0
Adults	0	Adults	1
	32		28
			32
		Total	60

It will be noticed that there were 6⅔ per cent under 1 year, 40 per cent between 1 and 3 years, and 73 per cent of the total number under 8 years of age, proving that in this series the youngest children were by far the more susceptible but that a small percentage of adults and older children may contract the disease.

There were four families with two cases, and in each one of these the onset was so close together that it furnishes more evidence that the suggestion made in Dr. Aycock's article is correct: that they were not secondary cases but probably infected at the same time. The onsets were as follows:

T. O., aged 1½, onset, April 6; her sister F. O., aged 3, onset, April 10.

V. K., aged 3, onset, May 15; her sister K. K., aged 2, onset, May 17.

R. R., aged 3½, onset, June 9; his brother A. R., aged 4½, onset, June 9.

R. E., aged 17, onset, June 20; his brother H. E., aged 20, onset, June 25.

In obtaining the history I felt that, at times, the day of onset is given a day or two later than it might have occurred, especially in those cases in which the onset is not abrupt.

The families obtained their milk from twenty-seven dairies, had their own cow in six cases, and used condensed milk in two cases. Of the dairies, nine selling pasteurized milk sold to twenty-seven different families, and eighteen selling raw milk sold to twenty-five different families.

In those cases in which the dairy served more than one family, the onsets of the cases were so far between that it would seem that it was a coincidence and in no case would it seem possible that the disease was milk borne.

There were of those patients living in the same families 126 adults and ninety-eight children without any secondary

cases with the exception of those four instances in which there were two cases in one family and, as mentioned before, it did not seem that they could be secondary cases in view of the period of incubation.

J. L. POMEROY, M.D., County Health officer.
J. W. ROBINSON, M.D., Diagnostician,
Los Angeles County Department of Health.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

MOUTH WASH FOR LEAD WORKERS

To the Editor:—I understand that a mouth wash is in use by lead workers for the purpose of precipitating soluble salts of lead to an insoluble form. The formula for this mouth wash is not available in ordinary literature. Will you kindly forward a copy of any formula that has proved valuable for this purpose?

J. W. GARDAM, M.D., Kearny, N. J.

ANSWER.—The preparation frequently used is a dilute aromatic sulphuric acid (5 drops of aromatic sulphuric acid to a wineglass of water). More frequently this aromatic sulphuric acid in the same proportions is taken internally diluted in fresh lemonade or lemonade made from citric acid and lemon syrup. A drink made of magnesium sulphate in lemonade was formerly used in lead works also.

We feel called on to point out that neither of these procedures affords a very satisfactory method of preventing lead poisoning. Lead poisoning may arise from lead fumes or lead dusts entering either the lungs or the stomach by way of the nasal passages, as well as from lead entering the body orally. The opportunities for combating the hazard of lead through any mouth wash appear to be negligible. On the other hand, the use of such drinks or washes may lead to a sense of false security.

Following the ingestion of sulphuric acid lemonade or dilute sulphuric acid, lead sulphate is probably formed. This lead salt is believed to be less soluble than such others as the carbonate, acetate or chloride. However, the gastric and pancreatic juices tend to reconvert the sulphate into the more soluble forms. Besides, if by any chance some of the lead that has been changed to the sulphate form by the use of this dilute sulphuric acid is not reduced by the gastric or pancreatic juice, the worker is still not protected by the fact that he has in his intestinal tract the sulphate of lead. Though lead sulphate is believed to be far less soluble than white lead (basic lead carbonate), it is still sufficiently soluble and absorbable to produce plumbism.

We are disposed to regard as more efficacious the ingestion of fresh milk at meals and between meals, using about one quart of milk daily for every exposed worker. The theory supporting this is that the lead salts which may be in an insoluble form are transformed to a soluble form by the hydrochloric acid found in the gastric juice. The milk will neutralize any excess of hydrochloric acid by the "carbonate of milk and will fix it by the milk protein." (Carlson, A. J., and Woelfel, A.: Hygiene of the Painters' Trade, bull. 120, U. S. Bureau of Labor Statistics, 1913). There will therefore be no excess hydrochloric acid to dissolve the lead salt, and poisoning will be less imminent. In addition to lessening the absorbability of lead, milk is especially helpful in rendering harmless the lead already stored in the skeletal system.

All things considered, the use of any acid mouth wash or acid lemonades is not regarded with any great favor.

SODIUM PERBORATE IN PYORRHEA

To the Editor:—Can you tell me who is responsible for the introduction of sodium perborate in the treatment of pyorrhea alveolaris?

DAVID T. SMITH, M.D., Ray Brook, N. Y.

ANSWER.—Sodium perborate is used in dental infections when the responsible organisms are those of the anaerobic group of Vincent. This drug is particularly valuable in the acute or early stages but is of little influence when used in chronic Vincent's infection. Its value is attributed to the formation of hydrogen peroxide with the subsequent slow but constant liberation of oxygen when it is held in the mouth in solution.

Informed dentists do not confuse pyorrhea (so called) with Vincent's infection. The clinical picture is distinctly different in each.

Dr. Paul R. Stillman, New York, was one of the first to advocate its use in the literature of dentistry. "Without being the least certain, but from recollection only," he says, "I should attribute my own knowledge of its value to my colleague, Professor John Oppie McCall, New York University School of Dentistry."

LIME INFILTRATION OF THE CORNEA

To the Editor:—In Queries and Minor Notes (THE JOURNAL, August 7) is a discussion of lime infiltration of the cornea. Nothing is said about the use of neutral ammonium tartrate, as discussed by Drs. Otto and Hans Barkan of San Francisco in THE JOURNAL, Nov. 15, 1924.

This letter is written only because I consider the use of neutral ammonium tartrate in lime burns of the eye a milestone in industrial ophthalmology. It is so far superior to any other treatment I have ever used that my entire experience has been altered in these frequently disastrous cases.

G. HENRY MUNDT, M.D., Chicago.

HELIOTHERAPY IN PULMONARY TUBERCULOSIS

To the Editor:—In THE JOURNAL, June 12, the reviewer of "Intestinal Tuberculosis," by Brown and Sampson states that certain pulmonary processes react so severely to ray treatment as to make thorough heliotherapy of a concomitant extrapulmonary focus impossible. I have long understood this to be true but have been unable to find literature on it. Will you be good enough to give me references on this subject? If published, please omit name and address.

M.D., Pennsylvania.

ANSWER.—This letter was referred to Dr. Brown, who writes:

"Our experience has not led us to believe that rather intensive heliotherapy, using chiefly the artificial ultraviolet ray treatment, of extrapulmonary disease has any effect whatever on the lung. In fact, many of the patients with advanced pulmonary tuberculosis had intestinal tuberculosis as well. At times we do not protect the lungs from these rays but treat the rest of the body intensively. The only thing we notice is that the lungs apparently get better as the intestinal symptoms improve. We have had patients who had hemoptysis, shortly after starting this artificial heliotherapy. We suspended the treatment for two or three weeks and then began again without any ill results. These patients make an apparent recovery from the intestinal tuberculosis.

"We also have treated by roentgen rays many of the glandular lesions and at times some of the abdominal conditions, such as intestinal tuberculosis. Here, of course, we protect the lungs and get no reaction from them. In fact, we have one person under our care at present who has had a most intensive roentgen-ray treatment of the bones of the pelvis for a malignant growth. As far as I can make out, she has never had any pulmonary reaction. I do not feel that you need consider the pulmonary focus in treating extrapulmonary disease by heliotherapy."

ACTION OF MERCURIC SALICYLATE IN FAT ON HYPODERMIC NEEDLE

To the Editor:—I am using a suspension of mercuric salicylate in goose oil. Will it injure in any way the metal parts of my record syringes? Please omit name.

M.D., Baltimore.

ANSWER.—It is very unlikely that mercuric salicylate in a neutral fatty base would affect the metal parts of a syringe. No effect was observed on a piece of bright copper or on a nickel plated needle which were immersed in different tubes of mercuric salicylate in vegetable oil for twenty-four hours. On the other hand, a piece of bright copper was attacked sufficiently by a saturated solution of mercuric salicylate in water to give the solution a green coloration in twenty-four hours. No change was noted in a nickel plated steel needle after twenty-four hours' immersion in saturated mercuric salicylate solution.

LIGHT-HEADEDNESS IN NEPHRITIS—CONTRAINDICATIONS TO COFFEE

To the Editor:—Is there any remedy for the light-headed sensation so commonly complained of by those who have chronic interstitial nephritis? Also, is it the caffeine or the purine bodies contained in coffee that make it so objectionable in the nephritic diet? Kindly omit my name and address.

M.D., Pennsylvania.

ANSWER.—No definite single remedy can be suggested for the "light-headedness," as it may be due to a number of different conditions, each of which would require different

treatment. Thus, if it is due to high blood pressure and toxemia, several days of a milk diet plus catharsis might relieve it. If, on the other hand, it is due to anemia, eggs, green vegetables and iron medication would be indicated. Mild nerve sedatives like bromide or carbromal might be of some comfort in either case.

There is no objection to coffee or tea as far as the kidney is concerned. Caffeine is indeed, at times, a useful diuretic. It is only when there is insomnia, high blood pressure and cardiac irritability that caffeine may be objectionable because of its tendency to increase these disturbances.

COMPLICATIONS DURING CHILDBIRTH

To the Editor:—A primipara, aged 24, had irregular labor pains every two minutes, lasting thirty seconds, all day. At 9 p. m., examination showed the cervix dilated to the size of a half dollar. At 1 a. m. in the morning she was given 8 mm. of ergot by mouth, and at 2 a. m. labor pains ceased. About 10 a. m., she started having labor pains again, every minute, lasting twenty and forty seconds; at noon the pains stopped until 8 p. m., when they returned again. This time the pains were strong every minute, lasting thirty seconds and being somewhat irregular. Chloral and bromides were administered, also ether inhalations. The patient was restless and weak, had several fainting spells, would go to sleep for a moment, and arise screaming that something had torn loose. At 10 p. m., the same day, she was given 10 mm. of ergot hypodermically, and about midnight pains stopped. She had no more pains till 1 p. m. the third day, when the pains gradually grew more severe. Examination showed that the cervix was dilated to about the size of a dollar, with a left occipito-anterior presentation. About 6 p. m., the same day, the head was delivered. Pains stopped after the head was delivered and the patient did not have any pains for thirty seconds. The face of the fetus turned blue and black; the shoulder was delivered and then the extremities. The baby was asphyxiated, blue and cold, and after artificial respiration, hot and cold applications, the baby started breathing. The baby weighed 8½ pounds (3.8 kg.). The patient had a good postpartum recovery. Three weeks after the delivery, the mother had several attacks of chills and a fever of 104 F. Both mammary glands were painful; there was a hard mass over the right mammary gland. What is your explanation for these irregular pains? Why did she have such severe pains and fainting spells without dilatation of the cervix? Can you explain to me the cause of fever and chills three weeks after childbirth?

M.D., Chicago.

ANSWER.—The description of the labor pains and the remarks concerning the actual delivery indicate that the uterine activity in this case resembles closely that of tetanic contractions, either generalized or localized in one part of the uterus. In the past, this was a frequent occurrence because of the widespread use of ergot. In the present case, while ergot was not the primary cause, it most likely aggravated the condition. On both occasions when ergot was administered, pains stopped soon afterward and this agrees with the fact that frequently the end result of the administration of ergot is exactly the opposite of what is anticipated, because the uterus, instead of alternating between contraction and relaxation, remains firmly contracted. (Ergot should never be given before the uterus is empty except in cases of abruptio placentae.) In most cases of tetanus uteri the patients have an unstable nervous system or definite constitutional maldevelopment; but irritation of the cervix, such as attempts to dilate it forcibly, may produce the condition. Mechanical intervention can also produce tetanic contractions of the uterus.

The fainting spells and sensation of something tearing may have been due to irritation and injury of the peritoneum over the lower part of the uterus, and also to the severe pain associated with the lack of cervical dilatation.

The treatment in cases like this should be directed toward securing rest and sleep. Drugs, such as solution of pituitary and ergot, given to stimulate uterine activity, usually make matters worse. The patient should be given a prolonged hot bath, then a hot drink, 16 mg. of morphine hypodermically, and 4 Gm. of sodium bromide or 2 Gm. of chloral hydrate by rectum. Following this procedure, most patients sleep soundly for four or five hours, and, after they awaken, uterine contractions usually progress in a normal manner. In the cases in which the uterine activity remains irregular after a refreshing sleep, it is advisable to hasten dilatation of the cervix by packing the cervix and vagina with gauze saturated with boroglycerin or by the use of a colpeurynter. The moral courage of the patient must be maintained. It is usually inadvisable to administer an anesthetic long before the actual delivery, because most patients demand more and more of the anesthetic with the result that the uterine contractions weaken and operative intervention often becomes necessary.

From the meager information given, it would appear that the chills and fever that occurred three weeks after delivery were due to a breast infection. However, pyelitis and other extragenital infections must be borne in mind.

"FILLING THE PHYSICIAN'S PRESCRIPTION"

To the Editor:—In an article in one of the recent issues of THE JOURNAL, attention was called, by the author of the article, to the variations found on quantitative analyses of medicines obtained in various drug stores. These medicines were obtained on prescription. Under separate cover you will find two 1 ounce solutions each containing 6 drachms of potassium iodide—one made from Squibb's preparation and one from Powers and Weightman's product. You will note the difference in solubility. Perhaps this (drug impurity) explains many of the variations recorded in the article to which reference is made.

W. M. D., M.D., Scranton, Pa.

ANSWER.—The Association's Laboratory reports that one bottle contains potassium iodide and the other bottle contains potassium bromide. The discrepancy, therefore, is not attributable to impurities, but probably to the fact that the dispenser inadvertently got hold of a container which, one might presume from alphabetical arrangement, would be located nearby. In this case the consequences fortunately would not be serious, but the censure of carelessness is just as applicable as if the mistake might have been the cause of toxic results.

SOLUBILITY OF MERCUROCHROME-220 SOLUBLE

To the Editor:—1. Please advise me concerning the solubility of mercurochrome in alcohol; also in water, and whether it is soluble in an aqueous alcoholic solution. 2. At what percentage solution has alcohol its greatest antiseptic value?

J. D. RILEY, M.D., El Paso, Texas.

ANSWER.—1. Tests made over a year ago in the American Medical Association Chemical Laboratory showed that both the sodium salt (mercurochrome-220 soluble) and the anhydride form (mercurochrome-220) are practically insoluble in alcohol U. S. P. (95 per cent), just sufficient being dissolved to color the alcohol but not enough to be of therapeutic importance. Mercurochrome-220 soluble is readily soluble in water, however, and the solubility in hydro-alcoholic solutions varies according to the ratio of alcohol and water present. Scott and Hill report that they use a solution prepared by dissolving 2 Gm. of mercurochrome-220 soluble in 35 cc. of water and then adding, while stirring, 55 cc. of alcohol U. S. P. and 10 cc. of acetone (*J. Urol.* **14**:139 [Aug.] 1925).

2. From 70 to 80.

SPAHLINGER TREATMENT FOR TUBERCULOSIS

To the Editor:—What is the status of the Spahlinger method, which has been mentioned in rather unfavorable terms in THE JOURNAL, but concerning which there still seems to be some enthusiasm abroad? Please omit my name.

L. N. P., Illinois.

ANSWER.—From time to time M. Spahlinger has given out enthusiastic reports from his Geneva Hospital. Because of the favorable newspaper comment, more particularly in England, concerning this product a report was made on it by the Science Committee of the British Medical Association. In the statement of this committee published last spring (*Brit. M. J.* **1**:755 [April 24] 1926), the history of the preparation was summarized and the committee strongly emphasized that it cannot endorse "this or any new method until after a full and independent test." The committee formulated certain conditions which should be fulfilled by such vaccines as those prepared by Spahlinger, and concluded that: (1) The remedy is secret and the exact methods of preparation have never been fully published; (2) no investigations carried out under strict experimental conditions which afford direct and convincing evidence of curative action have been published; (3) the scheme suggested by the committee gives a full opportunity of testing the value of the treatment without any public disclosure of the methods of manufacture.

In a recent review of the Spahlinger Method (*Prescriber*, August, 1926, p. 304) the editor states that:

An impartial consideration of these reports leads one to the following conclusions: 1. Those who have visited Geneva invariably return with a favorable opinion of the treatment. 2. At the same time the attitude of these observers is purely one of enthusiasm; no one seems to have presented any scientific facts or logical data, the best that is reported being "wonderful cures." 3. In spite of urgent appeals by lay persons and by the public press, Spahlinger seems still to be waiting for money to continue his work. 4. One cannot help expressing surprise that Spahlinger has not adopted the very obvious expedient of converting himself into a limited company. The public rushes headlong into schemes of a much less worthy character and cheerfully parts with its money on shares in doubtful rubber plantations and still more doubtful gold mines—surely such an appeal would have a quick response. 5. There is something very mysterious about the whole business, which will have to be elucidated before we can expect to get much further.

Medical Education, Registration and Hospital Service

COMING EXAMINATIONS

AMERICAN BOARD FOR OPHTHALMIC EXAMINATIONS. Colorado: Denver, Sept. 13. Sec., Dr. William H. Wilder, 122 S. Michigan Ave., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY. Colorado: Denver, Sept. 13. Sec., Dr. H. W. Loeb, 1402 So. Grand Blvd., St. Louis, Mo.

ARIZONA: Phoenix, Oct. 5. Sec., Dr. W. O. Sweek, Phoenix.

CALIFORNIA: Sacramento, Oct. 18-21. Sec., Dr. Charles B. Pinkham, 906 Forum Bldg., Sacramento.

COLORADO: Denver, Oct. 5. Sec., Dr. David A. Strickler, 612 Empire Bldg., Denver.

FLORIDA: Tallahassee, Oct. 12-13. Sec., Dr. William M. Rowlett, Box 603, Tampa.

GEORGIA: Atlanta, Oct. 12-14. Sec., Dr. C. T. Nolan, Marietta.

IDAHO: Boise, Oct. 5. Commissioner of Law Enforcement, Mr. F. A. Jeter, Boise.

ILLINOIS: Chicago, Oct. 5-7. Supt., Regis. and Education, Mr. V. C. Michels, Springfield, Ill.

IOWA: Des Moines, Oct. 12-14. Commissioner, Dept. of Health, Dr. Henry Albert, Des Moines.

KANSAS: Topeka, Oct. 12. Sec., Dr. Albert S. Ross, Sabetha.

MICHIGAN: Lansing, Oct. 12-14. Sec., Dr. Guy L. Connor, 707 Stroh Bldg., Detroit.

MINNESOTA: Minneapolis, Oct. 5-7. Sec., Dr. A. E. Comstock, 636 Lowry Bldg., St. Paul.

MONTANA: Helena, Oct. 5-7. Sec., Dr. S. A. Cooney, Helena.

NEW HAMPSHIRE: Concord, Sept. 9-10. Sec., Dr. Charles Duncan, Concord.

NEW JERSEY: Trenton, Oct. 19-20. Sec., Dr. Charles B. Kelley, Trenton.

NEW MEXICO: Santa Fe, Oct. 11-12. Sec., Dr. W. T. Joyner, Roswell.

NEW YORK: Albany, Buffalo, New York and Syracuse, Sept. 20-23. Chief, Professional Exams. Bureau, Mr. Herbert J. Hamilton, State Education Building, Albany.

OKLAHOMA: Oklahoma City, Sept. 14-15. Sec., Dr. J. M. Byrum, Shawnee.

RHODE ISLAND: Providence, Oct. 7-8. Sec., Dr. B. U. Richards, Providence.

UTAH: Salt Lake City, Oct. 5. Director, Mr. J. T. Hammond, 412 State Capitol Bldg., Salt Lake City.

WISCONSIN: Basic Science Board, Madison, Sept. 18. Sec., Dr. M. F. Guyer, University of Wisconsin, Madison.

WYOMING: Cheyenne, Oct. 4-6. Sec., Dr. G. M. Anderson, Cheyenne.

Wyoming June Examination

Dr. G. M. Anderson, secretary of the Wyoming Board of Medical Examiners, reports the written examination held at Cheyenne, June 7-8, 1926. The examination covered 12 subjects and included 120 questions. An average of 75 per cent was required to pass. One candidate was examined and failed. Seven candidates, including 1 osteopath, were licensed by reciprocity. The following colleges were represented:

College	FAILED	Year Grad.	Per Cent
Baylor University College of Medicine		(1919)	71.7

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Northwestern University Medical School		(1918)	California
Tuft's College Medical School		(1925)	New Jersey
Univ. of Nebraska College of Medicine		(1910)	Maine
Medical Dept. of the Univ. of the City of New York		(1925, 2)	Nebraska
Osteopath		(1880)	Minnesota
			Missouri

Oklahoma June Examination

Dr. J. M. Byrum, secretary of the Oklahoma Board of Medical Examiners, reports the written examination held at Oklahoma City, June 15-16, 1926. The examination covered 12 subjects and included 120 questions. An average of 75 per cent was required to pass. Forty-one candidates were examined, all of whom passed. Five candidates were licensed by reciprocity. The following colleges were represented:

College	PASSED	Year Grad.	Number Passed
Indiana University School of Medicine		(1926)	1
State University of Iowa College of Medicine		(1925)	1
University of Louisville School of Medicine		(1925)	1
Harvard University		(1925)	1
University of Oklahoma School of Medicine		(1926)	36
University of Virginia Department of Medicine		(1924)	1

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Arkansas Medical Department		(1915)	Arkansas
Chicago College of Medicine and Surgery		(1914)	Illinois
University of Pennsylvania School of Medicine		(1922)	Mississippi
University of Tennessee College of Medicine		(1925)	Tennessee
University of Texas Department of Medicine		(1913)	Texas

Book Notices

SIMPLIFIED INFANT FEEDING: With Eighty Illustrative Cases. By Roger H. Dennett, B.S., M.D., Professor of Diseases of Children and Director of the Department in the New York Post-Graduate Medical School. Third edition. Cloth. Price, $5. Pp. 415, with 14 illustrations. Philadelphia: J. B. Lippincott Company, 1926.

The success of any system of infant feeding is not inherent in that system but rather in its intelligent use. The term "system" misleads the student and conjures up for him visions of such mechanical devices as tables, slide rules and rotating score cards. Then what rôle system? Quoted in the preface to Dr. Dennett's first edition, Jacobi answers, "It *is* possible to be guided by rule" at first. In this edition the author maintains the method of describing cases to illustrate the various feeding problems and their solution. As no essential change in the simple feeding principles has been found necessary in at least eleven years since the first edition was published, it seems plausible that success with simple mixtures is not limited to the boys who man the infant welfare stations. It may be desirable but is not essential that every great pediatrician father a new baby food. Under the stimulus of enthusiastic feeding combinations taught in their particular schools, young men crusade forth spreading synthetic milks, administering acid milks, disseminating goat's milk, while preaching gelatin mixtures, casein, karo. Veterans of the simple methods like Dr. Dennett assume the fixed position of the figure Time in Lorado Taft's great group, and meditate on the flying whirls of the feeding cycles. In perspective there are indications for the newer preparations, and the author devotes several sections illustrating their application. On the other hand, routine use of complicated combinations brings them into disrepute. In medicine there are no panaceas, and in infant feeding only breast milk. Dr. Dennett's book has a practical tone throughout from the first chapter devoted to a synopsis of the entire text to the last one describing proprietary foods and containing the list of illustrative cases, list of tables, and caloric values of milks. Theories are introduced only when the subject requires illumination. The section on diarrheas due to individual food components would not appear to be so helpful from the angle of clinical recognition. In the table of lengths of babies under 3 years of age the values seem low for the average white child in private practice, particularly for the weights tabulated in the same section. From the standpoint of the baby there are newer discussions of dehydration and celiac disease. The sections on rickets and scurvy are delightful in their common sense and comprehensiveness, while happily devoid of cumbersome data.

GESCHLECHTSKRANKHEITEN BEI KINDERN. Ein ärtzlicher und sozialer Leitfaden für alle Zweige der Jugendpflege. Herausgegeben von A. Buschke und M. Gumpert. Paper. Price, 5,40 marks. Pp. 108, with 10 illustrations. Berlin: Julius Springer, 1926.

For two years the authors have been collecting clinical material concerning acquired venereal diseases of children, with the view of pointing out to physicians the increase in these diseases and also to stimulate attention and participation in their prophylaxis. The authors think that in order to recognize the social causes which permit the spread of these diseases, there should be cooperation between physicians, welfare workers, teachers and parents. They have found in their experience that welfare workers amoung children have little knowledge as to the cause or the communicability of sexual diseases. The workers are usually willing to help and evince a great interest, but they do not have the necessary technical information. On the other hand, the physician who at least has no difficulty in recognizing the disease condition is usually at a loss in giving adequate advice in discovering and remedying the underlying social conditions. In this little book a brief survey is made of the legal, medical, social and psychologic questions. Only the most essential points are considered. It is important that the physician should acquire the point of view of the social service worker;

on the other hand, it is equally important that the social worker should have correct information about the nature of these diseases, especially in order to protect the child in his surroundings from the dangers that are incident to these infections. The authors recognize that the extragenital infection of syphilis is not the usual method in childhood. Nevertheless, the disease may be spread in this way. They point out that there is a large area in Russia, the Balkan states and the tropics where syphilis is endemic and a greater part of the population is affected. Acquired syphilis among children has increased markedly during the last few years. The usual clinical description of congenital syphilis is given in a special chapter. The authors also devote a chapter to gonorrheal infections in children. They consider in some detail the mode of infection, the lesions produced, and the general symptomatology. There is a detailed account of gonorrheal infection of the rectum, as well as a statistical and symptomatic account of the disease in little boys. Considerable space is given to systemic infection produced by the gonococcus. They describe instances of joint and tendon infection, endocarditis and gonorrheal sepsis, as well as the occurrence of a papular eruption in some instances, or nodules in the skin in others. Infection of the cavities of the mouth and nose and gonorrheal ophthalmia are also referred to. A short chapter is contributed by Franz Kramer on the relation of genital infections to psychic disturbances. Kramer thinks that from 10 to 15 per cent of all cases of mental defectiveness are due to congenital syphilis. There is a considerable amount of information collected in this little volume referring to this group of disorders which should be of interest to physicians and also to social workers, nurses and others who are working in the field of infant and child welfare.

EDUCATION AND THE GOOD LIFE. By Bertrand Russell. Cloth. Price, $2.50. Pp. 319. New York: Boni & Liveright, 1926.

Bertrand Russell's writings are always interesting; one accordingly takes up a book of his with agreeable anticipations. It is an interesting, thought-provoking book; but we have not found it "thrilling," "eloquent" or "fascinating," to enumerate some of the terms that have been applied to it by reviewers. More appropriate seems the judgment of John Dewey, that "the chief characteristic of the book is enlightened empirical common sense." This is an accurate characterization, and it is no mean praise. The work is a practical study of elementary education from the standpoint of one who is a careful observer of childhood and who has a philosophical mind. The title is rather misleading. "Education and the Good Life" suggests something broader than a study of elementary education, and this book is not that. In fact, all of it except one chapter devoted to the university confines itself to a study of childhood and of primary education. Some of the author's economic and social doctrines are not universally accepted, and some of his conclusions from these premises would therefore be questioned by some men; but this does not detract from the fact that the book is an exceedingly keen and wise study of the child's intellectual development and of the education that children need. After the capacity for observation and the philosophical mind which the work shows, its main characteristic is sympathetic common sense. It is a book that can be enthusiastically recommended to parents. If its teachings were generally known and followed, we would see much less frequently the self-centered children with their unhappy sense of self-importance and, by the same token, many more wholesome-minded children—and adults. Only one chapter is devoted to the university, and this of necessity is sketchy. It contains, however, many interesting observations shocking to our self-deceptions and illustrating the author's independent, original mind:

> I am convinced that, at present, only a minority of the population can profit by a scholastic education prolonged to the age of twenty-one or twenty-two (p. 301).
>
> Obviously, the principle of selection (for university training) ought to be educational, not financial (p. 302).
>
> Snobbery makes successful businessmen send their sons to Oxford (some American names might be substituted here) to be turned into "gentlemen" (p. 303).
>
> At present it is very difficult to enter upon such a profession as law or medicine unless one's parents have a certain amount of money. The consequence is that the principle of selection is social and hereditary, not fitness for the work (p. 306).
>
> The idea of the university as a place of leisure where rich young men loaf for three or four years is dying, but, like Charles II, it is an unconscionable time about it (p. 308).

One puts down the book feeling that one would like to have Russell supplement it by a book that really meets the title—a book on the philosophy of life as a whole and on the relation of education, not simply of preliminary education, to it. There are a number of things on which one would differ with Russell, but on the whole it would be immensely interesting and stimulating.

THE TREASURY OF HUMAN INHERITANCE. By Karl Pearson, F.R.S. Volume II. Anomalies and Diseases of the Eye. Part II. Colour-Blindness. By Julia Bell, M.A., M.R.C.S., L.R.C.P. Nettleship Memorial Volume. Eugenics Laboratory Memoirs, XXIII. Paper. Price, 45 shillings net. Pp. 267, with illustrations. London: Cambridge University Press, 1926.

Part II of this scholarly volume is divided into six sections, of which the first three are mainly text. Section I opens with a historical outline of our knowledge of color vision, discusses normal color vision, the solar spectrum, and the anatomy concerned, and ends with a subsection on color vision in animals. The author has searched for the earliest contributions to the subject among Greek writings of about 500 B. C., and follows the development of our ideas down to the present day. In concluding this section she writes: "One is struck by the elusiveness of the phenomena of colour vision, and by the sadly little we really know about it." Total color-blindness, both congenital and acquired, is discussed in the second main section. Exhaustive investigation of and comment on the literature has made possible the publication in this single work of important hypotheses, theories and conclusions. Under the heading "Congenital Colour-Blindness," the final text section deals with those phenomena which, as the author explains, are more exactly described by such terms as "dichromatic vision" or "red-green blindness." The literature of this defect is considered from the standpoints of its history, its frequency and geographic distribution, its nature, its occurrence in women, and its hereditary aspects. Sections IV, V and VI comprise a bibliography and pedigree plates with descriptions of them. The plates are excellent and the descriptions clear. This volume is not the last word on color blindness, for that word has not yet been spoken; but it is the last word to date, indispensable as a point of departure for further investigation, and a worthy as well as an appropriate memorial to Edward Nettleship.

CLINIQUE MÉDICALE DES ENFANTS: Troubles de la nutrition et de la croissance. Par P. Nobécourt, Professeur de clinique médicale des enfants à la Faculté de médecine de Paris. Paper. Price, 36 francs. Pp. 404, with 113 illustrations. Paris: Masson et Cie, 1926.

In this volume on the disturbances of growth and nutrition in children, Nobécourt follows the method he employed in the previous volumes on the affections of the circulatory and respiratory systems. He relates case histories, shows the methods used to arrive at a diagnosis, and points out the difficulties encountered and the treatment instituted. With these cases as a basis he discusses the material in the light of present conceptions, and seeks to draw conclusions that seem most logical in light of the present state of our knowledge. The first portion of the book is devoted to the consideration of hypothyroidism in children. The morphologic characteristics of congenital myxedema are given, and the effect of this condition on growth fully elaborated. Nobécourt states that it is evident that the thyroid secretes substances which act on growth. These substances are termed hormones, but he points out that we know nothing of their nature or mode of action. In regard to the hypotrophies, or infantilism, the author gives two large etiologic classes, the acquired and the congenital, hereditary or constitutional. He states that deficient alimentation and infections are the factors of importance in production of the acquired type. The influence of heredity on the child is well known. Intoxications, infections, diatheses and temperament are factors bearing on this type. Particularly important is syphilis in the parents. The neuro-arthritic and lymphatic diatheses also lead to infan-

tilism. Several chapters are devoted to gigantism and acromegaly. The case of a girl presenting this syndrome is discussed. The condition started without any appreciable cause when she was 9 years old. There was no hypophysial tumor or any evidence of syphilis. The author states that in the absence of any known causation it is difficult to institute efficacious treatment. Gigantism may be physiologic or pathologic. In the latter group it may be due to a tumor of the hypophysis, syphilis, cerebral lesions or disturbances of the endocrine glands. The cause cannot be demonstrated in all cases. Obesity is divided into three types: the nonendocrine, for which no etiologic factor has been discovered; the endocrine, due to pluriglandular disturbances, and that due to cerebral lesions such as is seen in idiocy. A large portion of the book is devoted to the consideration of diabetes mellitus in children, with details of the dietary management and the use of insulin. Consideration is also given to acetonemia in diabetes, cyclic vomiting, chronic articular rheumatism and fragilitas ossium. All the subjects are treated in a thorough and interesting manner. The material presented is unusual, and the book contains much information that will aid the physician in understanding these conditions of disturbed growth and nutrition, which are so difficult to alleviate.

Books Received

Books received are acknowledged in this column, and such acknowledgment must be regarded as a sufficient return for the courtesy of the sender. Selections will be made for more extensive review in the interests of our readers and as space permits.

ERGEBNISSE DER MEDIZINISCHEN STRAHLENFORSCHUNG (RÖNTGENDIAGNOSTIK, RÖNTGEN-, RADIUM- UND LICHTTHERAPIE). Herausgegeben von H. Holfelder, H. Holthusen, O. Jüngling, und H. Martius. Band II. Paper. Price, 52.50 marks. Pp. 594, with 523 illustrations. Leipsic: Georg Thieme, 1926.

Second volume of new German system on light in diagnosis and treatment; the first was reviewed, Aug. 25, 1925.

ROENTGEN INTERPRETATION. A Manual for Students and Practitioners. By George W. Holmes, M.D., Roentgenologist to the Massachusetts General Hospital, and Howard E. Ruggles, M.D., Roentgenologist to the University of California Hospital. Third edition. Cloth. Price, $5. Pp. 326, with 226 illustrations. Philadelphia: Lea & Febiger, 1926.

Aid to physician or roentgenologist in study of roentgenograms.

A MANUAL OF RADIOACTIVITY. By George Hevesy, Ph.D., and Fritz Paneth, Ph.D. Translated by Robert W. Lawson, D.Sc. Cloth. Price, $5. Pp. 252, with 42 illustrations. New York: Oxford University Press, 1926.

Analysis of various types of ray activity leaning largely to physical rather than medical views.

TECHNIQUE DES PRÉLÈVEMENTS ET DES BIOPSIES DANS LA PRATIQUE CLINIQUE. Par Robert Dupont, Roger Leroux, chef des travaux d'anatomie pathologique à la Faculté de Paris, et Jean Dalsace, chef de laboratoire à l'hôpital Saint-Antoine. Préface du Professeur G. Roussy. Paper. Price, 48 cents. Pp. 142, with 50 illustrations. Paris: Masson & Cie, 1926.

Handbook of laboratory diagnosis.

HAY-FEVER AND ASTHMA. A Practical Handbook for Hay-Fever and Asthma Patients. By Ray M. Balyeat, A.M., M.D., Instructor in Medicine in the University of Oklahoma Medical School. Cloth. Price, $2. Pp. 198, with 27 illustrations. Philadelphia: F. A. Davis Company, 1926.

Sensible summary of current knowledge with reports of author's cases.

ERINNERUNGEN AN HEINRICH CURSCHMANN. Von Fritz Curschmann, Hans Curschmann, Carl Hirsch, und Felix Wolff. Boards. Price, 4.50 marks. Pp. 88, with 6 illustrations. Berlin: Julius Springer, 1926.

The life of a versatile German scientist, artist and writer, prepared by his loving relatives and friends.

CARBOHYDRATE METABOLISM AND INSULIN. By John James Rickard Macleod, F.R.S., M.B., LL.D., Professor of Physiology, University of Toronto, Canada. Cloth. Price, $6. Pp. 357, with illustrations. New York: Longmans, Green & Co., 1926.

Complete monograph on physiology of insulin.

FIRST QUARTER CENTURY IN THE FIGHT AGAINST TUBERCULOSIS, 1901-1926. Paper. Pp. 109, with illustrations. Columbus: Ohio Public Health Association, 1926.

Handbook of Ohio's share in the struggle against tuberculosis.

LA SÉCRÉTION INTERNE DU PANCRÉAS ET L'INSULINE. Par André Choay, docteur en médecine, pharmacien, medaille d'or de l'internat des hôpitaux de Paris. Paper. Price, $2. Pp. 570, with 7 illustrations. Paris: Masson & Cie, 1926.

French monograph on insulin, mostly bibliographic.

HAUTKRANKHEITEN. Von Dr. Georg Alexander Rost, o. Professor der Dermatologie und Direktor der Universitätshautklinik in Freiburg im Breisgau. Cloth. Price, 27 marks. Pp. 405, with 104 illustrations. Berlin: Julius Springer, 1926.

Beautifully illustrated guide to diseases of the skin.

FUNDAMENTALS OF DERMATOLOGY. By Alfred Schalek, M.D., Professor of Dermatology and Syphilology, University of Nebraska College of Medicine. Cloth. Price, $3. Pp. 239, with 54 illustrations. Philadelphia: Lea & Febiger, 1926.

Dermatology outlined for ready reference.

SÉMIOLOGIE OCULAIRE, LE CRISTALLIN. Anatomie. Physiologie. Pathologie. Par Félix Terrien, professeur à la Faculté de médecine de Paris. Paper. Price, $1.44. Pp. 240, with 158 illustrations. Paris: Masson & Cie, 1926.

Pathology and treatment of cataract.

SAINT BARTHOLOMEW'S HOSPITAL REPORTS. Edited by W. McAdam Eccles, Sir Thomas Horder, Sir Bernard Spilsbury, W. Langdon Brown, W. Girling Ball, and Geoffrey Evans. Vol. LIX. Cloth. Price, £1-1-0 net. Pp. 206, with illustrations. London: John Murray, 1926.

Collection of addresses by hospital staff.

TREATMENT OF CANCER: Its Successful Medicinal Treatment. By J. Murray, M.D. Cloth. Price, $2.50. Pp. 123. Joliet, 1925.

Author uses chlorides of nickel and iron and tells about it in his privately printed publication.

SORRELL AND SON. By Warwick Deeping. Cloth. Price, $2.50. Pp. 400. New York: Alfred A. Knopf, 1926.

Novel among best sellers, written by a physician and covering much medical interest.

UEBER ENCEPHALOGRAPHIE IM KINDESALTER. Von Dr. Th. Brehme, Assistent an der Universitäts-Kinderklinik in Heidelberg. Paper. Price, 4.20 marks. Pp. 50, with 45 illustrations. Berlin: S. Karger, 1926.

Roentgen-ray photography of the brain in children and its uses.

"BILHARZIA," A PAPER FOR THE PRACTITIONER. By F. Gordon Cawston, M.D. Boards. Pp. 20. London: John Bale, Sons & Danielsson, Ltd., 1925.

Reprint of brief essay in *Journal of Tropical Medicine*.

BIRTH CONTROL AND THE STATE. A Plea and a Forecast. By C. P. Blacker, M.C., M.A., M.R.C.S. Cloth. Price, $1. Pp. 87. New York: E. P. Dutton & Company, 1926.

Inspiring essay in "Today and Tomorrow" series.

LES ENTÉROPATHIES MICROBIENNES. Par Prof. G. Sanarelli, directeur de l'institut d'hygiène de l'Université de Rome. Paper. Price, 80 cents. Pp. 227, with 28 illustrations. Paris: Masson & Cie, 1926.

Intestinal infections, especially cholera.

LES CURIOSITÉS DE LA MÉDECINE: Les fonctions de la vie. Par Docteur Cabanès. Paper. Price, 10 francs. Pp. 368. Paris: E. le François, 1926.

Collection of medical anecdotes.

PERNICIOUS ANEMIA. By Frank A. Evans, M.D. Cloth. Price, $2.50. Pp. 178. Baltimore: Williams & Wilkins Company, 1926.

Monographic survey of current information.

AMERICAN INSTRUCTORS OF THE DEAF. Report of the Proceedings of the Twenty-Fourth Meeting of the Convention of American Instructors of the Deaf, June 29 to July 4, 1925. Cloth. Pp. 207, with illustrations. Washington: Government Printing Office, 1926.

TRAITEMENT DES MALADIES MENTALES PAR LES CHOCS. Par C. Pascal, médecin en chef des asiles publics d'aliénés de la Seine, et Jean Davesne. Paper. Price, 60 cents. Pp. 182. Paris: Masson & Cie, 1926.

THE SCIENTIFIC BASIS OF CHEMOTHERAPY. Part 1. By Iwan I. Ostromislensky, Ph.D., M.D. Paper. Price, $1.50. Pp. 142. New York: Inter-American Medical Publishing Company, 1926.

NEW AND NONOFFICIAL REMEDIES, 1926. Cloth. Price, $1.50. Pp. 459. Chicago: American Medical Association, 1926.

Medicolegal

Admissibility of Testimony to Complaints of Patient

(Raymond & Whitcomb Co. v. Ebsary (U. S.), 9 Fed. R. (2d) 889)

The United States Circuit Court of Appeals, second circuit, says, in this action for damages wherein the wife of plaintiff Ebsary testified as to what she had heard him tell a physician as to his condition and what she had overheard the physician say as to the condition of her husband, that an attending physician may testify to complaints made to him when he attends a patient for the purpose of treating him; but the testimony of a third person, other than a physician, of complaints and statements is not admissible. It differs from information given by a patient to a physician who is attending him professionally. Furthermore, the court says that what transpired days later than when the alleged cause of action arose was not part of the res gestae (essential circumstances of the case). It was hearsay. Expressions of mental or bodily injuries or mental feeling of an individual, which are made at the time of injury, are admissible in evidence. Representations made by a sick person of the nature and effects of a malady then made are admissible. A physician's testimony as to such statements, which formed a part of the res gestae, is competent evidence. But this rule has no application to statements made to the physician days after. They are not part of the res gestae.

Account Between Physicians—Check Stubs as Evidence

(Rose v. King (Ark.), 279 S. W. R. 373)

The Supreme Court of Arkansas says that the plaintiff and the defendant were physicians and for a number of years had offices with a common reception room. They had a working agreement by which the plaintiff was to receive a stipulated sum for administering anesthetics to the private patients of the defendant. They had a settlement in 1920, showing that the defendant owed the plaintiff $1,405, at which time the defendant paid $1,000 on the account. Their testimony was in conflict as to whether the balance was subsequently paid. In 1920, the defendant, who was chief surgeon of a miners' hospital association, selected the plaintiff as his assistant. In addition to the professional services they rendered the hospital, each had his private or charge patients. The old arrangement was continued as to the private patients of the defendant after the plaintiff's employment at the hospital. Neither of the physicians kept a regular set of books. The plaintiff kept a card index called a loose leaf or slip system. The defendant made notations on stubs of his checks showing the purpose for which the checks were given. After the plaintiff severed his connection with the hospital, he made up a statement of account from the card index, showing a balance due him by the defendant of $2,015 for administering anesthetics to and making roentgenograms of the defendant's private patients from the date of their settlement in 1920 to March 1, 1924, and made this the basis of the suit. The defendant testified that he had paid the plaintiff all that he owed him except $60, which he owed for administering anesthetics from Dec. 5, 1923, to March 1, 1924, and he was permitted to introduce a number of check stubs, on which notations had been entered by him showing the months for which he paid the plaintiff. The notation on the last stub introduced showed that a check had been issued to the plaintiff, Dec. 5, 1923, amounting to $120 for July, August, September, October and November, 1923, for anesthetics. The defendant testified that he depended on the plaintiff to keep the account between them, and would pay the bills when presented, noting at the time on the stubs of the checks for what they were given. The result was a judgment for the plaintiff for $60, which is affirmed, after his appeal therefrom as insufficient.

There was sufficient testimony of a substantial nature in the record to sustain the verdict and judgment for $60. The last stub showed that the check covered services rendered in the months of July to November, 1923. It was unlikely that the defendant would have paid for these services before paying for services rendered at an earlier date. The stubs introduced showed payment for various months during the several years covered by the arrangement. These stubs strongly corroborated the testimony of the defendant that he paid the plaintiff for the services rendered prior to Dec. 5, 1923. It was urged that the stubs were inadmissible because in no sense an account book. They were introduced in connection with the defendant's testimony showing that they constituted the only and original record he made of the transactions, and that the notations thereon were made by him contemporaneously with the several transactions. Nor was it reversible error to permit the jury to call for and take the stubs to their room after retiring to consider the case.

Due Process of Law and Equal Protection of the Laws

(State of Missouri ex rel. Hurwitz v. North et al., Board of Health of State of Missouri (U. S.), 46 Sup. Ct. R. 384)

The Supreme Court of the United States, in affirming a judgment of the Supreme Court of Missouri, says that the plaintiff in error (the relator) was a physician licensed to practice by the state board of health of Missouri. On complaint made to the board, and after notice and hearing, his license to practice was revoked on the ground that he had unlawfully produced an abortion. The proceedings before the board were reviewed on certiorari by the state circuit court and the determination of the board sustained. On appeal to the Supreme Court of Missouri, the judgment was affirmed (264 S. W. 678, 304 Mo. 607).

By section 7336 of the Missouri revised statutes, the state board of health is authorized to grant licenses for the practice of medicine within the state, and, after hearing, to revoke licenses, "for producing criminal abortions" and for other specified causes. Hearings are required to be on twenty days' written notice, personally served on the physican against whom charges are made, containing "an exact statement of the charges and the date and place set for hearing." The statute provides that:

> Testimony may be taken by deposition, to be used in evidence on the trial of such charges before the board in the same manner and under the same rules and practice as is now provided for the taking of depositions in civil cases.

It is also provided that proceedings before the board may be reviewed by the state circuit court on certiorari and, as was done here, an appeal may be taken from the judgment of the circuit court to the supreme court of the state.

The plaintiff's assignments of error assailed the correctness of various rulings of the state court as to the meaning and effect of the statute drawn in question. Those assignments must be disregarded here, as on writ of error to a state court this court is bound by its construction of the state law. The Supreme Court of Missouri held that, in the proceedings for the revocation of the plaintiff's license, he was entitled to take testimony on deposition, as provided by the statute, but not to subpena witnesses to appear before the board, and that his application for such subpenas was properly denied. It was assigned as error that these rulings and the revocation of the plaintiff's license by the state board of health were a denial of due process of law and of the equal protection of the laws under the fourteenth amendment to the constitution of the United States. It has been so often pointed out in the opinions of this court that the fourteenth amendment is concerned with the substance and not with the forms of procedure as to make unnecessary any extended discussion of the question here presented. The due process clause does not guarantee to a citizen of a state any particular form or method of state procedure. Its requirements are satisfied if he has reasonable notice, and reasonable opportunity to be heard and to present his claim or defense; due regard being had to the nature of the proceedings and the character of the rights that may be affected by it.

The procedure authorized by the Missouri statute, as it was applied by the board, satisfied these requirements. The notice prescribed was reasonable. The testimony of all witnesses who appeared before the board was taken and

recorded, including that of the plaintiff in error. Although the statute did not authorize the board to issue subpenas, the plaintiff in error was authorized, as the state court held, to take the depositions of witnesses who did not voluntarily appear. Officers who take depositions are authorized to compel witnesses to attend and give testimony (Rev. Stat. Mo. 1919, sec 5460). The depositions, when taken, may be read at the hearing before the board. The procedure prescribed and followed here gave ample opportunity to the plaintiff to make a defense to the charges preferred, and there was no denial of due process.

Nor did the statute deny to the plaintiff in error the equal protection of the laws. A statute that places all physicians in a single class, and prescribes a uniform standard of professional attainment and conduct, as a condition of the practice of their profession, and a reasonable procedure applicable to them as a class to insure conformity to that standard does not deny the equal protection of the laws within the meaning of the fourteenth amendment.

Not Required to Make Inquiry as to Latent Ailments

(Willey v. Alaska Packers' Ass'n (U. S.), 9 Fed. R. (2d) 937)

The United States District Court, N. D. California, S. D., in rendering a decree for the defendant, says that this suit was brought by an executor to recover damages for the death of a seaman, who, on an Alaskan fishing voyage, fell overboard, as a result of which he contracted a severe cold that was followed by a bad cough, from which death by tuberculosis eventually followed. It was contended that tuberculosis is an arrestable disease, and that in this case it was directly traceable to a cold, which would have been cured if the seaman had been furnished with timely medical attention. But the court holds that there was an abundance of evidence to the effect that the man's death resulted, if not from his own negligence, in any event from the fault of no one else. Though it manifestly is the duty of a master (or owner) to furnish proper medical attention and necessities to the seamen over whom he has charge, whether they request it or not, when a seaman himself does not consider himself sick, and makes no complaint whatever, this obligation cannot be held so extensive as to require inquiry as to latent ailments.

Thrombus Phlebitis Not Result of Accident

(Frank v. Chicago, M. & St. P. Ry. Co. (S. D.), 207 N. W. R. 89)

The Supreme Court of South Dakota, in affirming a judgment reversing an order granting an award under the workmen's compensation act, says that the sole question to be determined was whether or not the claimant's affliction was the result of an accident. To be compensable under the workmen's compensation act, merely experiencing the first symptoms of a disease while working is not sufficient—the injury must occur because of the work. The injury to the claimant's leg was concededly (or at least no other explanation was given) the result of a clot of blood in the femoral vein of the leg. The direct cause of all the pain, fever, swelling and other complications was the clot of blood. What caused the clot of blood? The defendant company said that it was disease or infection, and in this was pretty well supported by medical authority. The claimant said that it was the labor which he was performing, and supported this contention by the circumstances surrounding the first appearance of the affliction and some admissions of the medical men. Assuming the truth of his testimony, the first pain was felt suddenly while he was in the performance of his regular duties of pushing a loaded wheelbarrow up an inclined plain. No unusual strain was claimed, but, because the pain came on suddenly, it might be inferred that something had given way or broken in the human anatomy, and that the muscular exertion of labor was the force which caused the break.

Many of the cases cited by the claimant treat as accidents broken blood vessels occurring under the strain of labor, and he argued that, if a broken blood vessel may be the result of an accident, a distended blood vessel not broken may be. No doubt this is true, if the work distends the blood vessel, so as to result in injury. Whether a sudden distention of a blood vessel which does not break can result in injury this court does not know. The evidence in this case did not warrant the assumption that that happened. The varicosity of the veins in this case was explained as due to the clogging of the femoral vein and a consequent burden on the outer veins of the leg in carrying the blood theretofore carried by the femoral vein. It was not the strain that caused the distention of the veins, but the clot of blood. The medical authorities say that labor will not cause a thrombus, but that it results from infection. Even the lay mind knows that a clot of blood will not form suddenly from a strain. This differs from a case of a burst blood vessel resulting in slow paralysis. While the paralysis may progress slowly, the bursting vein causing it is of a definite sudden occurrence, directly traceable to a strain. Any exertion that increases the heart action no doubt distends the veins and arteries in increased pulsations and consequent burden on the veins, but this is usual, expected and not injurious. Exercise is usually considered beneficial. Perhaps too much exercise or labor may be injurious and produce varicose or permanently distended veins, but such a condition must be classed as a disease—it cannot be classed as caused by accident. If the claimant's ailment was thrombus phlebitis, and there was no evidence that it was anything else, it would not have been the result of an accident arising out of and in the course of his employment, but it was a disease resulting from some cause other than an injury by accident.

Society Proceedings

COMING MEETINGS

American Academy of Ophthalmology and Otolaryngology, Colorado Springs, Sept. 13-18. Dr. Luther C. Peter, N. E. Cor. Chestnut and 20th Streets, Philadelphia, Secretary.

American Association for Thoracic Surgery, Montreal, Canada, Sept. 30. Dr. Ethan Flagg Butler, Robert Packer Hospital, Sayre, Pa., Secretary.

American Association of Obstetricians, Gynecologists and Abdominal Surgeons, Chicago, Sept. 20-22. Dr. James E. Davis, 111 Josephine Ave., Detroit, Secretary.

American Climatological and Clinical Association, Philadelphia, Sept. 27-28. Dr. A. K. Stone, Auburn Street, Framingham Center, Massachusetts, Secretary.

American College of Physical Therapy, Chicago, Oct. 18-23. Dr. R. W. Fouts, City National Bank Building, Omaha, Secretary.

American Electrotherapeutic Association, Atlantic City, Sept. 8-11. Dr. Richard Kovacs, 223 E. 68th Street, New York City, Secretary.

American Public Health Association, Buffalo, Oct. 11-14. Mr. Homer N. Calver, 370 Seventh Avenue, New York, Executive Secretary.

Association of Military Surgeons of the United States, Philadelphia, Oct. 14-16. Col. J. R. Kean, U. S. A., Ret., Army Medical Museum, Washington, D. C., Secretary.

Central States Pediatric Society, St. Louis, Oct. 22-23. Dr. H. T. Price, Westinghouse Building, Pittsburgh, Secretary.

Central Tri-State Medical Society, Huntington, W. Va., Sept. 9. Dr. F. O. Marple, 418 Eleventh Street, Huntington, Secretary.

Colorado State Medical Society, Colorado Springs, Sept. 21-23. Dr. F. B. Stephenson, 460 Metropolitan Building, Denver, Secretary.

Delaware State Medical Society, Dover, Oct. 12-13. Dr. W. O. La Motte, Industrial Trust Building, Wilmington, Secretary.

Idaho State Medical Association, Sandpoint, Sept. 2-5. Dr. J. N. Davis, Kimberly, Secretary.

Indiana State Medical Association, West Baden, Sept. 22-24. Mr. T. A. Hendricks, Hume-Mansur Building, Indianapolis, Executive Secretary.

Inter-State Postgraduate Medical Association of North America, Cleveland, Oct. 18-22. Dr. W. B. Peck, 82 Stephenson Street, Freeport, Ill., Managing Director.

Kentucky State Medical Association, Frankfort, Sept. 20-23. Dr. A. T. McCormack, 532 West Main Street, Louisville, Secretary.

Michigan State Medical Society, Lansing, Sept. 14-17. Dr. F. C. Warnshuis, Powers Theatre Building, Grand Rapids, Secretary.

Missouri Valley, Medical Society of the, Council Bluffs-Omaha, Sept. 15-17. Dr. Charles Wood Fassett, 115 East 31st St., Kansas City, Mo., Sec'y.

National Tuberculosis Association, Washington, D. C., Oct. 4-7. Dr. George M. Kober, 1819 Eye Street, N. W., Washington, D. C., Sec'y.

Nevada State Medical Association, Reno, Sept. 24-25. Dr. H. J. Brown, Gray-Reid Building, Reno, Secretary.

Pennsylvania, Medical Society of the State of, Philadelphia, Oct. 11-14. Dr. Walter F. Donaldson, Jenkins Arcade, Pittsburgh, Secretary.

Southwest, Medical Association of the, Kansas City, Mo., Oct. 5-9. Dr. E. H. Skinner, Rialto Building, Kansas City, Mo., Secretary.

Vermont State Medical Society, Burlington, Oct. 14-15. Dr. W. G. Ricker, 29 Main Street, St. Johnsbury, Secretary.

Virginia, Medical Society of, Norfolk, Oct. 12-15. Miss Agnes V. Edwards, 104½ West Grace Street, Richmond, Secretary.

Western Surgical Association, Duluth, Minn., Oct. 14-16. Dr. H. P. Ritchie, Lowry Building, St. Paul, Secretary.

Wisconsin, State Medical Society of, Madison, Sept. 15-17. Mr. J. G. Crownhart, 153 Oneida Street, Milwaukee, Executive Secretary.

Current Medical Literature

AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

American Journal of Hygiene, Baltimore

6: 507-619 (July) 1926

*Antimeningococcus Serums. A. Wadsworth and M. B. Kirkbride, Albany, N. Y.—p. 507.
Relationship of Plankton to Anopheline Larvae. L. T. Coggeshall, New York.—p. 556.
*Epidemiology of Pneumonia: Pneumococcus Carriers. J. P. Powell, R. M. Atwater and L. D. Felton, Boston.—p. 570.
Animal Infections with Trophozoites of Intestinal Protozoa: Their Bearing on Functions of Cysts. R. W. Hegner, Baltimore.—p. 593.
*Modifying Infections with Bird Malaria by Changing Sugar Content of Blood. R. W. Hegner and M. S. MacDougall, Baltimore.—p. 602.
Differential Fertility in United States. R. Pearl, Baltimore.—p. 610.
*Theory of Muscle Contraction. J. H. Clark, Baltimore.—p. 617.
Is Formation of Guarnieri Bodies an Exclusively Mammalian Response to Infection with Vaccine Virus? H. B. Andervont, Baltimore.—p. 618.

Use of Antimeningococcic Serums.—The importance of early diagnosis and prompt serum treatment is confirmed by Wadsworth and Kirkbride, but striking results were recorded in some of the patients treated late in the course of the disease.

Epidemiology of Pneumonia.—The data presented by Powell, Atwater and Felton serve to confirm the view that the disease pneumonia appears when there is a coincidence between infection with a pathogenic form of the pneumococcus and a lack of resistance in the same individual.

Modifying Malaria Infections by Changing Blood Sugar Curve.—The data obtained by Hegner and MacDougall show that an increase in the sugar content of the blood modifies the course of the infection, bringing about conditions favorable for the parasite and hence prolonging the infection until death results. According to this hypothesis, decreasing the sugar content of the blood should bring about unfavorable conditions for the parasite. The authors have attempted to do this with insulin with suggestive, but not conclusive results.

Theory of Muscle Contraction.—The theory proposed by Clark for muscle contraction is that, as a result of the increased acidity due to lactic acid formation, the substances in the anisotropic bands pass from the liquid to the solid crystal form. This would result in a closed packing of the molecules and a deformation which would bring about the mechanical shortening.

American Journal of Physiology, Baltimore

77: 1-244 (June) 1926

Action of Epinephrine and Acetyl-Choline on Coronary Arteries of Rabbit. F. M. Smith, G. H. Miller and V. C. Graber, Iowa City.—p. 1.
Uterine Contracting Power of Spinal Fluid After Administration of Extracts from Sex Glands and Other Organs. N. F. Blau and K. G. Hancher, New York.—p. 8.
*Source of Vitamin B in Nature M. T. Burrows and L. H. Jorstad, St. Louis.—p. 24.
*Source of Vitamin A in Nature. M. T. Burrows and L. H. Jorstad, St. Louis.—p. 38.
*Injection of Testis Material into Rat and Effect on Spermatogenesis. W. J. Quick, Chicago.—p. 51.
*Activity of Displaced Testes and Bearing on Problem of Function of Scrotum. C. R. Moore, Chicago.—p. 59.
Effect of Insulin on Decerebrate and Decapitate Cats. J. M. D. Olmsted and A. C. Taylor, Toronto.—p. 69.
Strontium as Source of Error in Blood Calcium Determinations. M. Fay, Galveston, Texas.—p. 73.
*Cryptorchid Testes and Testicular Hormone Production. R. M. Oslund, Chicago.—p. 76.
*Ligation of Vasa Efferentia in Rats. R. M. Oslund, Chicago.—p. 83.
Alveolar Carbon Dioxide Tension Following Vigorous Muscular Exercise. N. Cordero, St. Louis.—p. 91.
*Suprarenal Insufficiency. F. G. Banting and S. Gairns, Toronto.—p. 100.
Blood and Urine Findings in Desuprarenalized Dogs. G. H. W. Lucas, Toronto.—p. 114.
*Anatomic Changes Which Follow Removal of Pineal Body from Both Sexes of Immature Albino Rat. Y. Izawa, Philadelphia.—p. 126.
Effect of Low Ash Feeding on Growth of Albino Mouse in Subsequent Periods on Complete Dietary: Economy of Food Consumption. H. B. Thompson, Los Angeles.—p. 140.
Choline as Motor Hormone for Alimentary Tract. M. G. Mulinos, Chicago.—p. 158.
Effect of Variations in Protein Intake on Acidity of Secretion of Fasting Stomach. F. Hoelzel, Chicago.—p. 166.
Suprarenal Secretion During Anaphylactic Shock. B. A. Houssay and E. A. Molinelli, Buenos Aires.—p. 181.
Suprarenal Discharge Produced by Drugs Injected into Suprarenal. B. A. Houssay and E. A. Molinelli, Buenos Aires.—p. 184.
Value of Egg Yolk in Supplementing Diets Deficient in Calcium. E. Tso, Peking.—p. 192.
Effects of Radiations from Quartz Mercury Vapor Arc on Some Properties of Proteins. H. L. Stedman and L. B. Mendel, New Haven, Conn.—p. 199.
Effect of Various Sugars (and of Epinephrine and Pituitary Extract) in Restoring Shivering Reflex. G. J. Cassidy, S. Dworkin and W. H. Finney, Montreal.—p. 211.
Physiology of Liver. XIII. As Site of Bilirubin Formation. F. C. Mann, C. Sheard, J. L. Bollman and E. J. Baldes, Rochester, Minn.—p. 219.
*Control of Parathyroid Tetany by Oral Administration of Ammonium Chloride. T. E. Boyd, W. C. Austin and E. F. Ducey, Chicago.—p. 225.
Basal Metabolism in Prolonged Fasting in Man. N. Kleitman, Chicago.—p. 233.

Source of Vitamin B in Nature.—Burrows and Jorstad assert that body cells can grow only when acted on by a certain concentration of a substance or substances formed by them or by other cells. This substance has been called the archusia (S). The archusia (S) is necessary not only for growth but all activities of the cell. In concentrations lower than that necessary for growth, it induces differentiation and function. In the normal developing organism it does not exist in quantities sufficient for the early growth and later differentiation and function. This growth is dependent on a supply of it from other sources. This substance formed by body cells is not specific. Body cells can be made to grow by the archusia formed by bacteria and other plant and animal cells. Extracts of tissues and bacteria containing various quantities of archusia (S) as tested on tissue cells act in the same proportions as vitamin B substitute in the diet of animals. Vitamin B is probably only the normal energy for life (the archusia [S]) formed by all cells in nature. It is the stimulus necessary for the normal growth, differentiation and function of the body.

Sources of Vitamin A in Nature.—Burrows and Jorstad have shown that cultures of bacteria in their periods of most active growth supply large quantities of vitamin B, but no vitamin A, and that this vitamin B is probably only the normal growth stimulus of any cell in nature. Vitamin A is supplied by these same cultures of bacteria after they have overgrown the medium and have been destroyed by this overgrowth. This vitamin is needed by the functioning organism to replace a certain soaplike substance or substances lost to the cell during its differentiation and function. Its source is the protoplasm of other cells in nature. Vitamin A is essential for the organism in that it is one of the essential substances used in the building of intercellular substances of the body (the connective tissue fibrils, bone, etc.) in the storage of fat and in the function of tissue cells.

Effect of Injected Testis Material on Spermatogenesis.—This investigation was made by Quick to determine whether the injection of spermatozoa or testis material in male rats has any specific effect on the testis or spermatozoa detectable histologically or by breeding experiments. From one to five subcutaneous or intraperitoneal injections of spermatozoon suspensions or macerated testis material into white rats had no apparent specific effect on the activities of the testis. Testes were found normal from three days to four months after the last injection. Spermatozoa from such testes were motile, and litters were obtained from matings in a major number of the cases. The injection of formed materials resulted in the formation of cysts in some cases, the size and position of some of which brought about mechanical displacement of the testes from their normal scrotal environment. Degeneration of these testes then occurred. Such conditions are not primarily related to the absorption of material into the blood stream of the animals. The scrotal position of the testis is emphasized as being essential for the continuance of normal testicular activity.

Activity of Displaced Testis.—An examination of testicular activity after displacement from its normal scrotal environment was made by Moore. He found that testes of the rat and guinea-pig removed from the scrotum to a subcutaneous location may continue their spermatogenic function from three to nine months, but spermatozoa are not formed. The partner to the subcutaneous testis that has been located in the abdomen for a similar length of time does not carry on its spermatogenic function. The conditions regulating this difference are external rather than internal and are considered to be an effect of the environment. In the subcutaneous location a partial reduction of temperature has occurred and to this extent testicular function can be carried on. These results are confirmative evidence that temperature regulation is necessary for the primary function of the testis and emphasize again the function of the scrotum as a heat regulatory mechanism necessary for the production of spermatozoa.

Functions of Cryptorchid Testes.—Natural cryptorchid testes of man, dog, pig and sheep were studied by Oslund with reference to their spermatogenic powers and testicular hormone production. It has been found that the cells in seminiferous tubules of cryptorchid testes are active and produce other cells. These form a second incomplete row of cells or push centrad in the tubules. Some of the cells resemble primitive spermatogonia. These cells produce spermatogonia in cryptorchid testes which show spermatogenic activity after placement in the scrotum. It is quite evident that germ cells are present in natural cryptorchid testes and that these cells are not only potentially active but actually undergo division. Contrary to most of the reports found in the literature, it therefore appears that germ cells are usually present in cryptorchid testes. Since cryptorchid testes have active germ cells they should produce sperm following surgical transfer to the scrotum. The most that can be said concerning hormone production in these testes is that it is produced during the absence of mature spermatogonia, spermatocytes, spermatids and spermatozoa.

Effect of Ligation of Vasa Efferentia.—Oslund avers that ligation of vasa efferentia in rats is followed by an increase in size and hardening of the testis. This is caused by the retention of spermatogenic products in the testis. The process reaches its height in about forty-eight hours. Within seven days the testis decreases in size and in hardness. This change is caused by a decrease in, if not a cessation of, spermatogenesis and by the absorption of the now necrotic material that was retained by the ligature. The process of degeneration progresses with duration of the experiment. Degeneration of germinal epithelium is accompanied by a decrease in the size of the seminiferous tubules. This is partly compensated for by an increase of intertubular space and partly by a decrease in the size of the testis. No interstitial cell hypertrophy has been found. The experiments were followed during a period of two months. Degeneration was still progressing, and there was no sign of recovery.

Suprarenal Insufficiency.—Banting and Gairns have studied the symptoms, blood chemical determinations and histologic pathology of sixteen dogs which had both suprarenals removed at one operation and of thirty-seven dogs in which an interval of from ten days to six weeks intervened between the removal of the first and second gland. Of the sixteen dogs in which double suprarenalectomy was performed, all died in from eight to fifty-four hours. The average length of survival was 26.8 hours, with the exception of dog 117, which survived 388 hours. Of the thirty-seven dogs in which suprarenalectomy was performed in two stages, twelve dogs survived less than fifty hours; ten survived from fifty to 100 hours; ten survived from 100 to 150 hours; three survived from 150 to 200 hours, and two survived from 200 to 238 hours. The tendency for an increase in the urea and nonprotein nitrogen and the decrease in the percentage of chlorides in the blood are the principal chemical changes. Up to the present, it has been impossible to prevent death in desuprarenalized dogs even when the urea, nonprotein nitrogen and chloride have been maintained at an almost normal level. The outstanding postmortem findings of enlarged lymph glands, degeneration of the liver cords, and nephrosis of the kidney strongly indicate the accumulation of a toxic substance. Further evidence to support this fact is that the blood of dogs that died a true desuprarenal death is toxic. A protein diet with its consequent accumulation of the protein-split products shortens the duration of survival and hastens death in partially desuprarenalized dogs. The fact that histamine is thirty times more toxic after suprarenalectomy suggests that the poison is of a protein-like nature.

Results of Removal of Pineal Body.—Izawa says that complete removal of the pineal body is followed in the albino rat by accelerated growth in the body weight and in the sex organs in both sexes. Normally, therefore, it serves to retard these growth processes in the albino rat. The retardations in the growth of the eye in both sexes and of the hypophysis in the females after operation may be secondary effects.

Controlling Parathyroid Tetany with Ammonium Chloride.—Ammonium chloride, given by mouth to parathyroidectomized dogs in doses of 0.25 to 1.0 Gm. per kilogram of body weight daily, reduces the frequency and severity of tetany attacks. The period of survival of such animals is considerably prolonged, but recovery does not as a rule occur. Death is commonly preceded by a period of several days of anorexia and depression, without tetany. Boyd, Austin and Ducey have not been able to obtain a consistent rise in the blood calcium concentration after the administration of ammonium chloride.

American Journal of Roentgenology and Radium Therapy, New York

15: 497-601 (June) 1926

*Neoplastic Nature of Lymphatic Leukemia: Relation to Lymphosarcoma. W. A. Evans and T. Leucutia, Detroit.—p. 497.
*Skin Reactions After Divided Roentgen-Ray Dosage. W. Stenström and W. L. Mattick, Buffalo.—p. 513.
*Stimulation of Endocrine Glands with Radium. W. Wolf, New York.—p. 520.
*Lymphoblastoma (Hodgkin's Disease) of Sternum. R. Dresser, Boston.—p. 525.
*Metastatic Carcinoma in Bone. J. H. Luscinian, Miami, Fla.—p. 530.
*Diffuse Vertebral Metastasis of Prostatic Carcinoma Without Bony Changes. W. M. Simpson, Ann Arbor, Mich.—p. 534.
Roentgenologic Diagnosis of Benign and Malignant Gastric Tumors in One Patient. L. G. Rigler, Minneapolis.—p. 542.

Neoplastic Nature of Lymphatic Leukemia.—Three cases of lymphosarcoma are described by Evans and Leucutia which in their terminal stages changed into lymphatic leukemia. These three cases are the only lymphosarcomas in a group of sixteen patients treated by deep roentgen-ray therapy during the last four years, which had a fatal termination. In all three cases radiation therapy produced prolongation of life with entire disappearance of the manifest lesions treated, but later extension to the bone marrow occurred. At the time of the bone marrow involvement, all three patients had developed the picture of lymphatic leukemia. Evidence is thus brought that lymphosarcoma, if life is sufficiently prolonged, may change into lymphatic leukemia. This happens as soon as the bone marrow involvement becomes the predominating feature of the disease.

Danger of Divided Roentgen-Ray Dosage.—Stenström and Mattick point out the dangers that are attached to the divided and repeated irradiations with large doses and emphasize the necessity of considering each patient individually.

Stimulation of Endocrine Glands with Radium.—Radium distributed evenly over an area 2 by 4 inches in a specially constructed applicator was used by Wolf to stimulate endocrine glands. A hypothesis has been formulated to serve as a working basis for his experiments and to attempt to explain his own observations, as well as those of other authors. This hypothesis seems to fit in quite well with many empirically found results. All of the important known glands of internal secretion were treated by radium irradiation and definite results were obtained in the case of the suprarenals, thyroid, ovaries, pituitary, testes and parathyroids. In the case of the pineal gland and the islands of Langerhans, the results were too indefinite to warrant a report at this time.

Lymphoblastoma of Sternum.—In a review of ninety-five cases of lymphoblastoma observed in the department of radia-

tion therapy of the Massachusetts General Hospital during the past three years, Dresser found four cases which presented a tumor mass in the region of the sternum. One of these cases, which was very completely studied, is reported in some detail; the others are briefly summarized.

Hyperplastic Metastatic Carcinoma of Bone.—Two cases illustrating an unusual form of metastasis in bone from carcinoma of the breast are reported by Luscinian. There was complete absence of bone destruction; the lesions were represented by hyperplasia alone.

Metastatic Vertebral Carcinomatosis Without Bony Changes.—A case in which a medullary carcinoma of the prostate gland gave no clinical, roentgenographic, or gross anatomic evidence of vertebral metastasis is reported by Simpson. Subsequent microscopic study of decalcified bone sections from the vertebral bodies revealed generalized vertebral carcinomatosis, without bone destruction or bone proliferation.

Annals of Surgery, Philadelphia

83: 737-874 (June) 1926

Tularemia: Two Cases. J. B. Flick, Philadelphia.—p. 737.
Treatment of Acute Traumatic Craniocerebral Injuries. A. S. Maclaire, New York.—p. 741.
*Asymmetry of Mandible from Unilateral Hypertrophy. A. Gruca and E. Meisels, Lwów, Poland.—p. 755.
*Prevention of Postoperative Thyrotoxicosis by Postoperative Iodinization. J. L. DeCourcy, Cincinnati.—p. 768.
*Dissection of Axilla in Radical Operations for Cancer of the Breast. J. E. Jennings, New York.—p. 770.
*Accessory Pancreas, Causing Congenital Pyloric Stenosis. K. Hale, Wilmington, Ohio.—p. 774.
*External Fecal Fistula Following Appendicitis. J. B. Deaver, Philadelphia.—p. 782.
Pathogenic Colon. J. W. Draper, New York.—p. 790.
*Primary Tuberculosis of Gallbladder. F. W. Rankin and F. M. Massie, Lexington, Ky.—p. 800.
*Retroperitoneal Tuberculous Lymphadenitis. I. S. Ravdin, Philadelphia. —p. 807.
Mesenteric Lymphadenitis: Eight Cases. A. O. Wilensky and L. J. Hahn, New York.—p. 812.
*Penetrating Bullet Wound of Thoracic Aorta Followed by Lodgment of Bullet in Femoral Artery. G. P. LaRoque, Richmond, Va.—p. 827.
*Disinfection of Hands. H. Lilienthal and J. M. Ziegler, New York. —p. 831.

Asymmetry of Mandible.—Gruca and Meisels report one case and review fourteen cases from the literature. They favor early resection of the articular head of the mandible as the only treatment to be considered.

Prevention of Postoperative Thyrotoxicosis.—As soon as the patient returns to bed, DeCourcy injects 30 minims (2 cc.) of compound solution of iodine by rectum. This is repeated in eight hours. Fluids are given by rectum and encouraged by mouth if they do not cause nausea. He has noticed a remarkable improvement in the convalescence of these patients with an absence of the muscular tremor, tachycardia, restlessness and fever.

Dissection of Axilla in Breast Cancer Operations.—Jennings is of the opinion that the axillary skin should be considered as a dangerous area and removed in routine with the breast, the pectoral muscles, the entire axillary contents *en bloc* and a wide dissection of the deep fascia. He makes an incision which encircles the breast below but extends upward into the axilla so as to include all the axillary skin between the latissimus dorsi behind and the pectorals in front.

Accessory Pancreas Causes Pyloric Stenosis.—Hale suggests that an aberrant pancreas may be the etiologic factor in congenital stenosis of the pylorus. He urges that serial sections be made of any pylorus removed at necropsy showing congenital stenosis to determine whether or not this assumption is correct.

External Fecal Fistula Following Appendicitis.—Deaver refers to 222 cases of postappendical fecal fistula, occurring among 4,655 cases of acute appendicitis, an incidence of slightly less than 5 per cent. Of these 222 fistulas, eighty-six healed spontaneously, while 108 required operative repair. The remainder of the patients were discharged from the hospital having refused operation, or were sent home to recuperate and to return for operation if necessary, but failed to do so. The shortest duration of fecal drainage in this series of cases was in one case in which the opening closed twelve hours after its presence was discovered, while the other extreme shows a patient who had an intermittent fecal fistula for nine years. The surgical procedure necessary for repair was dependent on conditions. In 55.5 per cent of cases, simple inversion of the fistulous opening by a purse-string suture followed by reinforcement by an additional suture line was the only procedure required. In 15 per cent of cases, the condition of the bowel after this procedure was such as to excite doubt as to its regenerative power in the presence of the usual fecal stream, so that an ileocolostomy was performed to short-circuit the affected bowel. Twenty-three per cent of cases presented either multiple fistulas or else the fistula was so large as to preclude closure with maintenance of the lumen of the bowel. Some cases showed extensive ulceration in the part of the bowel surrounding the fistula, so that hope for the recovery of this portion had to be abandoned. These required resection of the bowel varying from a small portion of the cecum to resection of a foot or more of the terminal ileum with the cecum and entire ascending colon. Ileocolostomy was of necessity the last stage of the operation. Of the 108 patients operated on, eighty-nine were discharged from the hospital perfectly healed. In ten instances, there was a recurrence of the fistula. These usually healed spontaneously, but in some instances required further resection of the affected portion of the bowel.

Primary Tuberculosis of Gallbladder.—To the fifteen cases of primary tuberculosis of the gallbladder recounted in the literature, Rankin and Massie add one case.

Retroperitoneal Tuberculous Lymphadenitis.—The chief complaint made by Ravdin's two patients was of a dull pain in the epigastrium which was relieved entirely by removal of the affected glands.

Bullet Wound of Thoracic Aorta.—LaRoque's patient was shot in the left side of the back just internal to the vertebral border of the scapula. The man continued to run a short distance, but his left leg gave way and he was compelled to stop. His chief complaint was of a bullet in his body and of weakness and pain in the left leg. There was a penetrating wound of the chest, a large hemothorax and a bullet wound blockage of the femoral artery. There was no evidence of injury to the retroperitoneal structures. The external iliac-femoral artery was thoroughly examined at operation almost to its origin, and there was no wound of this vessel.

Disinfection of Hands.—The steps of the procedure for disinfecting the hands employed by Lilienthal and Ziegler are as follows: (1) The dry finger tips should be immersed in tincture of iodine, removed immediately and the tincture permitted to dry for five minutes. (2) While this is going on, the remainder of the hands, including the wrists, should be painted with a lampblack mixture up to the limits of the iodine. (3) Then the hands are washed by rubbing with the cleanser (a soap containing 85 per cent water, a small amount of free alkali and various volatile oils) without water for about one-half minute. (4) They are rinsed under hot running water. (5) They should be scrubbed with the cleanser and brush until all traces of lampblack have disappeared, the arms scrubbed as usual at the same time. (6) The hands should be scrubbed with alcohol in the usual fashion. It will then be found that most of the iodine discoloration will have disappeared. The hands may now be dried with sterile towels and the gloves and gown put on.

Archives of Dermatology and Syphilology, Chicago

14: 1-110 (July) 1926

*Hereditary Hemorrhagic Telangiectasia. C. M. Williams, New York.—p. 1.
Significance of Cutaneous Stimuli for Protection of Body Against Infection. A. M. Memmesheimer, Cincinnati.—p. 4.
*Infantile Acne Vulgaris. S. Ayres, Jr., Los Angeles.—p. 12.
*Granuloma Inguinale. M. Goldzieher and S. M. Peck, New York.—p. 14.
*Lymphosarcoma. F. C. Combes, Jr., New York.—p. 28.
Lymphogranulomatosis Inguinalis: Three Cases. V. Pardo-Castello, Havana, Cuba.—p. 35.
Fox-Fordyce Syndrome. H. Goodman, New York.—p. 46.

Fordyce's Condition of Penis. W. H. Goeckerman, Rochester, Minn. —p. 50.
Schamberg's "Peculiar Progressive Pigmentary Disease of Skin." L. K. McCafferty, New York.—p. 53.

Hereditary Hemorrhagic Telangiectasia.—Williams reports four cases of hemorrhagic telangiectasia complete in every respect, and a fifth in which only the family history is lacking, all observed within four weeks, of a disease which he says is not mentioned in the majority of textbooks on dermatology, and which is supposedly so rare that only about thirty-two families are reported in medical literature. The essentials of the disease are: (1) The occurrence of nosebleed in childhood, often recurring throughout the life of the patient, and sometimes associated with bleeding from other mucous membranes, or even, after traumatism, from the skin. The bleeding may decrease as the patient grows older, or may become more and more serious and finally prove fatal. (2) The development of telangiectasiae, sometimes as dilated capillaries, sometimes as a network of dilated venules, more characteristically as spider nevi; occurs sometimes in youth, more often in adolescence or adult life, and usually increases with the passing years. (3) The occurrence of these symptoms in several members of the family. Usually the same individual presents both groups of symptoms, but sometimes one group or the other may be missing in an individual case.

Infantile Acne Vulgaris.—Three cases of acne vulgaris occurring in infants are reported by Ayres. All the patients were boys. Two of the patients were being fed on breast milk exclusively at the time the eruption began. All of the patients were otherwise normal, except for slight constipation in one and later a brief attack of acute eczema, seborrhea of the scalp in one, and a brief attack of diarrhea in one.

Granuloma Inguinale.—Seven cases of granuloma venereum have been studied by Goldzieher and Peck. The diagnosis was made by the characteristic clinical appearance; the demonstration of *Bacillus venereogranulomatis* in smear, section and culture and complement fixation and allergic skin reactions. The best therapeutic results were obtained by the combined use of *B. venereogranulomatis* vaccine, with antimony and potassium tartrate.

Lymphosarcoma.—The first of Combes' patients presented multiple tumors which histologically bore a definite resemblance to mycosis fungoides, although clinically the lesions were typical of lymphosarcoma. In the second case, the lesion was single, and resembled the Spiegler-Fendt sarcoid. In the first case the lesions all responded promptly to filtered roentgen-ray therapy, a complete resolution occurring within three months, but a few months later the patient began to complain of increasing weakness and dyspnea. Physical examination of his chest revealed enlargement of the mediastinal and peribronchial lymph glands. Deep roentgen-ray therapy brought about no improvement, and the patient died from acute cardiac insufficiency within six weeks. In the second case temporary improvement followed the administration of solution of potassium arsenite (Fowler's solution) internally, but the patient died nonetheless.

Archives of Surgery, Chicago

13: 1-152 (July) 1926

*Chronic Duodenal Ileus. C. C. Higgins, Cleveland.—p. 1.
*Puncture Wounds of Cerebellum. H. L. Foss, Danville, Pa.—p. 43.
*Growth Disturbances Following Resection of Joints. S. L. Haas, San Francisco.—p. 56.
*Primary Congenital Megalo-Ureters. J. S. Eisenstaedt, Chicago.—p. 64.
*Sarcoma of Stomach. C. E. Farr, New York.—p. 75.
*Partial Tracheal Obstruction: Effects on Circulation and Respiration. A. Blalock, T. R. Harrison, Nashville, Tenn., and C. P. Wilson, Boston.—p. 81.
*Postoperative Colon Bacilluria. C. C. Pinkerton, Akron, Ohio.—p. 96.
Spontaneous Dislocation of Tendon of Long Head of Biceps Brachii: Four Cases. A. W. Meyer, Palo Alto, Calif.—p. 109.
*Pulmonary Complications Following Anesthesia and Operation. I. S. Ravdin and R. A. Kern, Philadelphia.—p. 120.
Review of Urologic Surgery. A. J. Scholl, Los Angeles, E. S. Judd, Rochester, Minn., L. D. Keyser, Roanoke, Va., G. S. Foulds, Toronto and J. Verbrugge, Antwerp, Belgium.—p. 126.

Chronic Duodenal Ileus.—A study of fifty-seven cases has convinced Higgins that chronic duodenal ileus is not a rare condition, and there are undoubtedly many cases that have not been diagnosed. On account of the severe headache associated with this condition, a diagnosis of migraine is usually made; some patients have been treated for migraine for years and have passed through the clinics of excellent diagnosticians in a search for relief. In all cases of severe headache associated with vomiting, a careful examination of the duodenum should always be made. In cases in which the dilatation is insufficient to produce duodenal stasis and is associated with gastroptosis, an effort should be made to secure relief by nonoperative measures. If the dilatation is marked and stasis with antiperistalsis is present, a duodenojejunostomy should be performed. The mortality for duodenojejunostomy is practically nil, and excellent results may be expected. Resection of the right colon is indicated in few cases and should be performed only as a last resort. Gastroenterostomy should not be performed, as the stasis in the duodenum is not relieved and a vicious circle is established. A careful roentgen-ray examination of the duodenum should be made and a correct preoperative diagnosis established. A comprehensive history and a careful physical examination may suffice to make a correct diagnosis which, however, should be verified by roentgen ray. Dilatation of the duodenum is a clinical entity, and a characteristic picture is present in most of the cases.

Puncture Wound of Cerebellum.—Foss relates the case of a boy, aged 2½ years, who sustained a penetrating wound of the cerebellum from a crochet hook entering the jugular foramen by way of the mouth. The hook was removed, and the patient recovered. The hook had traversed the lateral wall of the pharynx, had entered the jugular foramen, and had penetrated the left cerebellar hemisphere to a depth of 5 cm. This is said to be the only case of the kind on record.

Growth Disturbances Following Joint Resection.—Haas shows experimentally that a careful resection of the knee joint, in which the entire articular cartilage and a thin layer of adjoining bone is removed, will cause practically no disturbance in length growth. It is important not to injure the epiphyseal cartilage plate and to refrain from passing fixation sutures through the actively growing columns of cartilage cells. It is advisable not to strip up the soft parts too near to the epiphyseal cartilage plate because of the chances of injuring its blood supply and thereby causing some growth cessation.

Primary Congenital Megalo-Ureters.—The two cases of primary congenital megalo-ureters reported by Eisenstaedt occurred in girls, aged 5 and 7½ years, respectively. Both girls entered the hospital with the history of dysuria and increased frequency of urination since earliest childhood. The younger child died. A complete necropsy report of the intra-abdominal viscera is given. The elder child is alive and to date in excellent condition, except for the pathologic condition of the urinary tract.

Sarcoma of Stomach.—Of the two cases of sarcoma of the stomach presented by Farr, one, of the round cell type near the pylorus, closely resembled in its clinical aspects a caloused ulcer; the other, of the spindle cell type growing apparently from the musculature of the anterior wall of the stomach near the cardia, gave no clinical symptoms whatever until the day before operation. The patient with the round cell sarcoma who had a pylorectomy performed has made an apparently complete recovery. The patient with the spindle cell tumor, whose operation was necessarily incomplete, had a relapse after a year and died in less than two years.

Effects of Partial Tracheal Obstruction.—The effects of partial tracheal obstruction on the blood gases, blood reaction and volume flow was studied experimentally in dogs by Blalock et al. The results of the examinations are reported.

Postoperative Colon Bacilluria.—An attempt was made by Pinkerton to determine the importance of laboratory reports that show *Bacillus coli* in the urine of patients following operation. An unselected series of 130 general surgical cases was studied to determine by culture the incidence and significance of postoperative colon bacilluria. It was found that

the colon bacillus appears in the urine of a certain percentage of male and female patients who present themselves for surgical operation. The same organism appears in an appreciably larger percentage after operation, often without subjective or objective symptoms of a urinary tract infection. Among female surgical patients of this series, the colon bacilluria was present from three to five times more often than among the males. Colon bacilli occurring in the urine in abundance after operation is a presumptive sign of urinary tract infection, but in the absence of other confirmatory evidence does not always account for postoperative complications. Gynecologic patients, as a class, have colon bacilli present in the urine after operation probably more often than any other class of surgical subjects.

Pulmonary Complications Following Anesthesia.—Among 5,966 operations, reviewed by Ravdin and Kern, sixty-nine respiratory complications after anesthesia occurred, an incidence of 1.15 per cent. Fifty-six cases presented lesions, lobar pneumonia, bronchopneumonia and bronchitis, in which infection played a part. Fourteen of the fifty-six patients gave a history of an acute respiratory infection before operation, and in nine of these the operation was of an emergency character. This larger group showed a definite seasonal incidence, while the thirteen cases of the smaller group, including embolism and atelectasis, occurred scattered throughout the year with no suggestion of a seasonal variation.

Boston Medical and Surgical Journal

195: 1-60 (July 1) 1926

*Acute Coronary Occlusion. L. Wolff and P. D. White, Boston.—p. 13.
Imperforate Anus. S. M. Fitchet, Boston.—p. 25.
Internist and Ophthalmoscope. H. A. Houghton, New York.—p. 31.
Trail of Typhoid Carrier. F. G. Curtis, Newton, Mass.—p. 35.
Umbilicus as Abdominal Landmark. S. R. Meaker and R. S.-G. Ho Hsieh, Boston.—p. 36.
Dr. Guillotin and His Machine. W. P. Coues, Brookline, Mass.—p. 37.

Acute Coronary Occlusion.—A study of acute coronary occlusion, based on nineteen cases of coronary thrombosis and four cases of coronary embolism, and a review of the literature, are presented by Wolff and White. In the literature the terms coronary occlusion, coronary thrombosis, coronary embolism and cardiac infarction are used interchangeably, or at least without sufficient regard for the exact meaning or significance of these terms, thus leading to confusion. The authors have chosen the term acute coronary occlusion, including all cases of sudden closure in which, as a rule, cardiac infarction occurs. Gradual coronary occlusion, in which cardiac infarction may or may not occur, is not discussed.

Journal of Bacteriology, Baltimore

11: 393-448 (June) 1926

Surface Tension and Bacterial Growth. W. M. Gibbs, H. W. Batchelor and T. N. Sickels, Moscow, Idaho.—p. 393.
Reduction of Selenium Compounds by Sporulating Anaerobes. I. C. Hall, Denver.—p. 407.
Utilization of Salts of Organic Acids by Colon-Aerogenes Group. S. A. Koser, Urbana, Ill.—p. 409.
Production of Catalase by Anaerobic Organism. J. M. Sherman, Ithaca, N. Y.—p. 417.
Studies in Microbic Heredity. VII. Fungi Found in Blastomycosis Hominis. R. R. Mellon, Rochester, N. Y.—p. 419.

Journal of Comparative Neurology, Philadelphia

40: 409-498 (June) 1926

Giant Nerve Fibers of Earthworm. H. B. Stough, Boston.—p. 409.
Resonance Theory of Weiss. S. R. Detwiler, Boston.—p. 465.
Primitive Lines of Amblystoma Jeffersonianum. F. L. Landacre, Columbus, Ohio.—p. 471.

Journal of Experimental Medicine, Baltimore

44: 1-145 (July 1) 1926

*Filter-Passing Virus Obtained from Dermacentor Andersoni. H. Noguchi, New York.—p. 1.
Organism Associated with Specific Infectious Cystitis and Pyelonephritis of Cows. F. S. Jones and R. B. Little, Princeton, N. J.—p. 11.
*Immunologic Studies with Herpes Virus: Herpes-Encephalitis Problem. H. Zinsser and F. Tang, Boston.—p. 21.
Skin Response of Rabbits to Nonhemolytic Streptococci. I. C. H. Andrewes, C. L. Derick and H. F. Swift, New York.—p. 35.
Id. II. Is Secondary Reaction an Arthus Phenomenon? C. L. Derick and C. H. Andrewes, New York.—p. 55.
Filling and Emptying of Gallbladder. G. H. Copher, S. Kodama and E. A. Graham, St. Louis.—p. 65.
Relation of Reticulo-Endothelial System to Blood Platelet Count. H. Koster, New York.—p. 75.
Relation Between Organ Weights and Obscure Lesions in Apparently Normal Rabbits. W. H. Brown, L. Pearce and C. M. Van Allen, New York.—p. 85.
Biologic Classification of Encapsulatus Pneumoniae (Friedländer's Bacillus). L. A. Julianelle, New York.—p. 113.
Rôle of Reticulo-Endothelial System in Immunity. III. Production of Active and Passive Anaphylaxis in Blocked Animal. C. W. Jungeblut and J. A. Berlot, Albany, N. Y.—p. 129.

Virus Obtained from Tick.—An invisible, filter-passing virus, pathogenic for the guinea-pig and capable of cultivation on special mediums for at least seven generations, has been isolated by Noguchi from a tick of the species *Dermacentor andersoni*. One of two monkeys (*Macacus rhesus*) inoculated became infected, and in one rabbit the result was negative. The virus has been transmitted from infected guinea-pigs to ticks, as also in one instance by tick feeding from an infected tick to a guinea-pig. The presence of the virus in the tick is more easily demonstrated by the inoculation of guinea-pigs with a suspension of the tick viscera. Continuous high fever (from 104.5 to 106.5 F.) and enlargement of the spleen are the chief symptoms of the infection in guinea-pigs. After the febrile attack, the guinea-pigs are not susceptible to reinoculation with the cultured virus but are subject to infection with the virus of spotted fever, and vice versa.

Herpes-Encephalitis Problem.—Experience forces Zinsser and Tang to the conclusion that no valid proof exists on which can be based an assertion concerning the identity of the virus of herpes with that of lethargic encephalitis. Either the two viruses are entirely unrelated, or else prolonged sojourn in the central nervous system of man attenuates the virus for rabbits to an extent analogous to that in which rabies virus is attenuated for man by passage through rabbits.

Journal of Infectious Diseases, Chicago

39: 1-88 (July) 1926

*Antibody Response After Immunotransfusion in Malignant Endocarditis. K. M. Howell, B. Portis and D. A. Beverley, Chicago.—p. 1.
*Apparent Mutation of Streptococci from Acute Malignant Endocarditis. K. M. Howell and D. A. Beverley, Chicago.—p. 12.
Differences in Peroxide Production and Methemoglobin Formation of Green (Alpha) Streptococci. E. Valentine, San Francisco.—p. 29.
Rôle of Bacteriophage in Streptococcus Infections. L. O. Dutton, Memphis, Tenn.—p. 48.
*Bactericidal Property of Whole Blood of Women Infected with Gonococcus. G. H. Robinson, Pittsburgh.—p. 61.
*Typhoid Vaccination by Mouth. V. Burke and L. Barnes, Pullman, Wash.—p. 67.
Glutathione Content of Animal Tissues with Reference to Tuberculosis. N. Uyei, Denver.—p. 73.
*Investigations on Rocky Mountain Spotted Fever in Colorado. F. E. Becker, Denver.—p. 82.

Immunotransfusion in Malignant Endocarditis.—In a case of acute malignant endocarditis, both *Streptococcus hemolyticus* and *S. viridans* were isolated by Howell et al. from the blood on three different occasions. During a period of five months, the patient received twelve transfusions of immune whole blood. Before immunotransfusion was begun, his blood serum contained no agglutinin for the streptococci isolated. The agglutinin titer of the recipient's blood serum also increased after each transfusion, as a rule running parallel with the agglutinin titer, and reaching values higher than those of the transfused blood. Complement-fixing antibodies also increased, but appeared later than agglutinin and opsonin and fluctuated more irregularly. The increase in specific antibodies of the recipient's blood, both as compared with its own original content and with that of the immune donors, is interpreted as evidence of the development of active as well as passive immunity as the result of immunotransfusion.

Mutation of Streptococci.—From the blood in a case that was clinically one of acute malignant endocarditis, Howell and Beverley isolated on three successive occasions two bacteriologically distinct organisms, *Streptococcus hemolyticus* and *S. viridans*. The two strains were morphologically different; the morphologic differences have remained constant over a period of two years. The sugar reactions, which were also different, have remained constant for the same period. Protection experiments with immune serums indicated that the two strains were different.

Bactericidal Property of Blood in Gonorrheal Infection.—The whole blood of normal persons, Robinson says, possesses but little bactericidal action on the gonococcus, but the blood of women having a gonococcal salpingitis exerts a strong bactericidal action on the gonococcus, most marked on the infecting strain, indicating a tendency toward strain specificity. This reaction is not dependable enough with heterologous strains to warrant its use as a diagnostic procedure. Treatment of patients having chronic gonococcal infection with either stock or autogenous vaccines would seem theoretically to offer little hope of success.

Typhoid Vaccination by Mouth.—Experiments were made by Burke and Barnes to determine whether typhoid proteins were absorbed unaltered from the digestive tract as determined by the appearance of agglutinins; whether the agglutination titer would vary with the method of preparing the vaccine; whether "per os" vaccination is as effective as the subcutaneous method in stimulating the production of typhoid agglutinins and to test the theory of increased cellular impermeability of the intestinal mucosa following the oral administration of typhoid vaccine. On the whole, the results obtained were not satisfactory.

Rocky Mountain Spotted Fever in Colorado.—According to Becker, Rocky Mountain spotted fever exists in Colorado with an average annual incidence of more than 2.57 cases and a mortality of 1.5 cases. The mortality rate lies between that of Idaho and the Bitter Root Valley in Montana. The disease is widely spread throughout the mountainous regions of the state with certain centers more heavily infected than others. The disease in several patients and in guinea-pigs infected from these patients and from wood ticks differed from the typical Montana form in the exhibition of marked gastrointestinal symptoms and lesions. Many micro-organisms, other than *D. rickettsi,* are found in local ticks. Certain symptoms of malaise, not typical of Rocky Mountain spotted fever, frequently follow tick bites in Colorado. Evidence supports the view that they are due to the tick bite, but are not a part of the clinical picture of Rocky Mountain spotted fever.

Journal of Nervous and Mental Disease, New York

63: 553-668 (June) 1926

Bergson's Conceptions as Applied to Psychopathology. E. Minkowski, Paris.—p. 553.
*Tryparsamide in Treatment of Late Neurosyphilis. J. R. Moore and I. C. Sutton, Los Angeles.—p. 569.
*Psychology of Essential Epileptic. L. P. Clark, New York.—p. 575.
Classification of Psychoses. L. B. Alford, St. Louis.—p. 586.

Tryparsamide in Late Neurosyphilis.—In the selection of patients for this treatment, it is the impression of Moore and Sutton that those who have received prolonged and intensive saturation with mercury and the arsphenamines show more striking gains than those who have received no preparatory treatment. The previously treated patient is also less subject to the Herxheimer-like flare-ups so often seen during the first course of tryparsamide injections. It is emphasized that tryparsamide is primarily a resistance builder and a healer of lesions, but not a spirocheticide. This fact precludes its use in early syphilis. Its greatest worth is in general paralysis and late tabes dorsalis, and in selected cases of central nervous system syphilis which have resisted systematic and combined intravenous and intraspinal therapy with the arsphenamines.

Psychology of Essential Epilepsy.—As a tentative formulation, Clark states that the essential epileptic person is intrinsically a specific pattern of oral and anal erotic in whom the clinical phase presented by him is the reaction formation of narcism known as the epileptic makeup; that the excess formation of the latter produces a rigidity and inelasticity of the personality incompatible with flexible living. Hence the explosive fit, the latter being a necessary corollary to the state as a whole.

Kansas Medical Society Journal, Topeka

26: 173-206 (June) 1926

Our Novitiates. F. Brown-Sherbon, Lawrence.—p. 178.
Varicose Veins and Ulcers of Leg. L. F. Barney, Kansas City.—p. 181.
Metropolitan Medical School of Future. C. F. Nelson, Lawrence.—p. 185.

Medical Journal and Record, New York

124: 1-60 (July 7) 1926

"John Bull" Spirit of Medicine. H. Crichton-Miller, London.—p. 1.
Acute Pericarditis. H. Elwyn, New York.—p. 6.
Benzyl Benzoate. D. I. Macht, Baltimore.—p. 10.
Dual Personality Apropos of Unusual Case of Amnesia. A. Gordon, Philadelphia.—p. 12.
Reducing Mortality from Carcinoma of Rectum. A. A. Landsman, New York.—p. 15.
Treatment of Cancer of Rectum. C. J. Drueck, Chicago.—p. 16.
*Idiopathic Paralysis Agitans. T. C. Fong, Washington, D. C.—p. 18.
Modus Operandi of Therapeutic Agents in Treatment of Infections. J. W. Wiltsie, Binghamton, N. Y.—p. 20.
Gynecologic Operation in Insanity. E. McDonald, Philadelphia.—p. 23.
*Puerperal Infection. D. H. Bessesen, Minneapolis.—p. 27.
*Early Diagnosis of Pregnancy and Prognosis of Sex. R. Weiss, Berlin.—p. 33.
Sedimentation Test in Gynecology. I. Smiley, New York.—p. 34.
*Caffeine in Breast Milk of Coffee and Tea Drinkers. R. R. Irvin, Pittsburgh.—p. 37.
Legacy of Greece to Galen. H. J. Wright, Pleasantville, N. Y.—p. 39.

Idiopathic Paralysis Agitans.—Fong reports a case of idiopathic paralysis agitans occurring in a white man, aged 35, who presented practically all of the cardinal symptoms and signs, and in whom no causation for the disease could be established. It is rather rare to see this disease occurring before the fifth decade of life.

Etiology of Puerperal Infection.—Bessesen suggests that the vaginal flora is the etiologic factor in a large number of puerperal infections. Such infection occurs during the second stage of labor. During uterine contraction, the cervix pulls away, exposing the presenting point of the fetus. As dilatation becomes more complete, this presenting point is contaminated by the vaginal mucosa with which it comes in contact. This is more marked when dilatation is complete and pains of a bearing down nature appear. At this time, the head of the fetus is forced down into the bulging perineum, while the cervix and lower uterine segment are retracted by that action of the uterus which is characteristic of the second stage of labor. During relaxation, the perineum forces the head back and the relaxed uterus allows the return of the cervix and lower uterine segment to their original position. Thus the contaminated head, either covered or not covered by the membranes, enters the uterus. This process is repeated as long as the second stage lasts, and so it is that in long labors infections are more common and more severe, often fatal. With each downward descent of the fetus into the vagina, a higher point of the fetal surface is contaminated by the bacteria which have previously been drawn into the uterus, and when the fetus again rises into the uterus, a higher point of the uterine interior is contaminated. Infections may occur with short second stage, where virulent bacteria are present in the vagina. This mechanism also pertains to the Credé expression of the placenta. Dry labor increases the number of infections owing to the prolonged action of the fetus descending into the vagina and ascending into the uterus. Any foreign body which passes through the infected vagina upward into the uterus, whether the cord, a part of the child, the hand of the obstetrician or an instrument, will increase these possibilities for puerperal infection. Prophylactic treatment is necessary to prevent the appearance of puerperal infection.

Early Diagnosis of Pregnancy.—Weiss describes the Paul Hirsch serologic test which takes its origin from the fact that naphthochinone sulphate of sodium gives a very characteristic dark coloration with amino groups, the intensity of which depends on the amount of the amino groups contained in the solution.

Caffeine in Breast Milk.—Irvin has examined the breast milk of coffee and tea drinkers for caffeine, and has constantly obtained a substance possessing the characteristics of caffeine. In crystalline shape, solubility in water and chloroform and in its capacity to be sublimed, this substance is highly suggestive of caffeine, or possibly a derivative thereof. Since it was found only in traces in human milk, its absolute identification was extremely difficult. These caffeine-like crystals were found to be absent in the breast milk of a woman who drank no coffee, tea or other alkaloid containing substances.

Minnesota Medicine, St. Paul

9: 291-364 (June) 1926

Dynamics of Personality. C. E. Riggs, St. Paul.—p. 291.
New Orientation of Psychoneuroses. C. R. Ball, St. Paul.—p. 297.
*Spontaneous Meningeal Hemorrhage: Seven Cases. E. M. Hammes, St. Paul.—p. 305.
Some Psycho-Analytic Considerations. F. Whitmore, St. Paul.—p. 311.
*Roentgen Ray and Metastases in Breast Cancer. W. A. Coventry, Duluth.—p. 316.
Ulcer of Duodenum. E. S. Judd, Rochester.—p. 320.
Oxyperitoneum. R. L. Laney, Puposky.—p. 323.
*Massive Collapse of Lung. L. G. Rigler, Minneapolis.—p. 326.
Rest in Treatment of Pulmonary Tuberculosis. F. F. Callahan, Pokegama.—p. 333.
*Presence of Diphtheria Bacilli in Nasal Cavity of New-Born. S. Amberg, Rochester.—p. 341.
Principles of Successful Cancer Surgery. W. E. Ground, Superior, Wis.—p. 342.

Spontaneous Meningeal Hemorrhage.—The characteristic symptoms of spontaneous meningeal hemorrhage are a hemorrhagic spinal fluid and evidence of meningeal irritation. Hammes asserts that this syndrome is sufficiently well defined to enable one to make the correct diagnosis. Although the clinical course is frequently a stormy one, the prognosis is often not as grave as the symptoms would indicate.

Roentgenotherapy of Breast Cancer and Metastases.—Coventry is becoming more and more convinced that postoperative roentgen-ray treatment of breast cancer cases is effectual only in preventing local recurrences and relieving pain, and that from clinical experience it does not prevent metastasis but has a tendency to scatter metastases and hurry the end.

Massive Collapse of Lung.—Nine cases of massive collapse of the lung are reported by Rigler: (1) uncomplicated, unilateral, postoperative massive collapse following cholecystectomy under local anesthesia in one case, and appendectomy in two cases; (2) two cases of postoperative massive collapse complicated by pneumonia, in one of which empyema also developed; (3) three cases of posttraumatic massive collapse, two following fracture of the spine and ribs, and (4) one case of alternate collapse and clearing extending over a long period of time with eventual recovery. This was also posttraumatic.

Diphtheria Bacilli in Nasal Cavity of New-Born.—Cultures were taken by Amberg from the nasal cavity of 421 new-born infants. The presence of diphtheroid bacilli was reported in seventeen instances; in one instance a doubtful bacillus was reported; in another there was a bacillus which morphologically had to be classified as a diphtheria bacillus. When more than one culture was taken, the diphtheroid bacilli happened to be found at only one examination. No efforts were made to determine the flora, but usually staphylococci were found, more rarely streptococci and other microorganisms, and there was a small number of inoculations without growth. Occasionally, there was an infant with rhinitis or conjunctivitis. In the latter cases, no microorganisms were demonstrable either by smear or by culture. Examination for inclusion bodies was not made.

New York State Journal of Medicine, New York

26: 585-626 (July 1) 1926

Cooperation Between State Medical Society and Health Agencies. G. M. Fisher, Utica.—p. 588.
Impressions of Cattaraugus County Health Department. E. P. Kolb, Holtsville.—p. 589.
Cattaraugus County Health Demonstration. A. L. Runals, Olean.—p. 591.
County Tuberculosis Work. R. E. Plunkett, Albany.—p. 592.
Value of Cattaraugus County Health Demonstration to State. E. M. Clark, Albany.—p. 593.
County Nursing Work. M. Kuhlman, Albany.—p. 593.
Demonstration and Boards of Supervisors. S. P. Hull, Petersburg.—p. 594.
Cattaraugus County Health Demonstration. A. Newsholme, England.—p. 595.
What is Health Work? H. Folk, New York.—p. 598.
Statistical Aspects of Demonstration. E. C. Burnham, New York.—p. 600.
Tuberculosis Work. W. C. Jensen, Olean.—p. 602.
Nutritional Work in Cattaraugus County. J. C. Gebhart, New York.—p. 604.
How to Conduct Campaign for County Health Department. G. J. Nelbach, New York.—p. 607.
Spiritual Value of Cattaraugus County Health Demonstration. J. A. Kingsbury, New York.—p. 608.
Impressions of Work. C. W. Munger, Valhalla.—p. 608.
Id. A. W. Towne, Syracuse.—p. 609.
Id. H. A. Brown, Buffalo.—p. 610.
From Pastor's Point of View. Michaelson, Ellicottville.—p. 610.
Impressions of Demonstration. E. P. Kolb, Holtsville.—p. 611.
Year of Progress. S. A. Douglas, Olean.—p. 612.

Southern Medical Journal, Birmingham, Ala.

19: 413-500 (June) 1926

*Hypertension. J. H. Gibbes, Columbia, S. C.—p. 413.
*Arterial Hypertension. T. P. Sprunt, Baltimore.—p. 416.
Treatment of Colic, Habitual Regurgitation and Sleeplessness in Early Infancy. T. C. Hempelmann, St. Louis.—p. 422.
*Periarteritis Nodosa. W. H. Harris, New Orleans.—p. 426.
Blastomycosis: Eight Cases. C. M. Hamilton, Nashville, Tenn.—p. 431.
Value of Roentgen-Ray Examination in Diseases of Esophagus. J. Paul and D. Y. Keith, Louisville, Ky.—p. 435.
Problems of Milk Production in South. J. J. Durrett and C. L. Isley, Jr., Memphis, Tenn.—p. 438.
Modern City Health Department Practice and Medical Profession. A. H. Flickwir, Houston, Texas.—p. 442.
Enervation of Stomach. J. A. Crisler, Jr., Memphis, Tenn.—p. 446.
Surgical Care of Toxic Thyroid. L. W. Frank, Louisville, Ky.—p. 450.
Goiter: 235 Cases. S. O. Black, Spartanburg, S. C.—p. 453.
Tetanus. J. M. Poer, West Point, Ga.—p. 456.
Application of Modern Urologic Diagnostic Methods in Pediatrics: Cases. H. W. McKay, Charlotte, N. C.—p. 460.
*Anaerobic Streptococci: Rôle in Puerperal Infection. O. Schwarz and W. J. Dieckmann, St. Louis.—p. 470.
Interpretation of Railway Signals by Sense of Color. A. E. Chace, Texarkana, Ark.—p. 479.
*Pituitary Body Tumors. L. Daily, Houston, Texas.—p. 485.
Prevalence of Sinus Infection. M. A. Lischkoff, Pensacola, Fla.—p. 493.

Analysis of Hypertension Cases.—Forty-nine of Gibbes' patients complained of symptoms that might be interpreted as referable to the cardiovascular renal system, while fifty-one presented complaints that would be commonly referred to other organs or systems of the body. The family history of cardiovascular renal disease was interpreted as positive in fifty-five cases, negative in twenty-three, and classed as unsatisfactory in twenty-two. The past history seems to be of little importance. The general symptomatology, aside from the presenting complaint and the present illness, was of interest because of the relatively high incidence of so-called digestive symptoms, constipation, headache or vertigo, and dyspnea and palpitation of the heart. A positive history of the nocturnal passage of urine in seventy-two patients is striking, stamping this symptom as the most important lead furnished by the patient as indicating the existence of hypertension. The data collected on physical examination show that cardiac hypertrophy is almost a part of the picture of hypertension, that focal infections are almost universally associated with it, and that hyperthyroidism is practically no part of it. Only one patient failed to show albumin in the urine. In 82 per cent of the improved cases, focal infections were found and removed; in 30 per cent of the unimproved cases this was done, and in only 11 per cent of the cases in which death occurred were focal infections eliminated.

Analysis of Arterial Hypertension Cases.—In arriving at a prognosis in cases of arterial hypertension, Sprunt says, the condition of the arteries is the most important prognostic sign. Patients with no sign of arterial change may be expected to do well. Those with normal urine and those with normal aortas in general show a rather favorable prognosis. Patients with marked retinal changes, with any sign of myocardial insufficiency, precordial pain or renal insufficiency, may be expected to live only a very few years. From the standpoint of age, the presence of a hypertension in the very young is of rather graver significance than in the very old. The onset of hypertension during the menopause in women presents the most favorable prognosis of all.

Periarteritis Nodosa.—Harris is of the opinion that the augmentation of the name to periarteritis nodosa aneurysma thrombotica would serve as an aid in the gross pathologic diagnosis of the disease. Basing his assumption on his experimental results, he regards periarteritis nodosa as a specific infectious disease which can be transmitted to the rabbit. The excitant of the induced lesions can be passed through a Berkefeld N filter and is to be included in the group of filter passers.

Anaerobic Streptococci in Puerperal Infection.—Schwarz and Dieckmann believe that anaerobic streptococci are frequently the causative factors of puerperal infection, that they cause chiefly a local foul smelling lochia and in their noninvasive state may be regarded as saprophytes. However, under certain favorable conditions, such as in the thrombi of the uterine veins, they subsequently reach the blood stream and cause serious and even fatal local complications. If the organisms are present in the uterus in overwhelming numbers, they may be carried to the peritoneum by way of the lymphatics. In the treatment of these cases, the authors recommend thorough cleansing of the uterus. In the event of a blood stream infection, they recommend early and frequent transfusion to combat the anemia and bring up the patient's resistance. In order that the real significance of this organism can be appreciated, it is necessary in all cases of suspected puerperal infection to grow uterine cultures both aerobically and anaerobically, in order that the incidence and seriousness of this organism can be better appreciated.

Pituitary Body Tumors.—Daily believes that pituitary body tumor is a much more common disease than is ordinarily believed to be the case and that its surgery is in the domain of the rhinologist.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Experimental Pathology, London

7: 95-160 (June) 1926

*Fever, Infections and Thyroid-Suprarenal Apparatus. W. Cramer.—p. 95.
Duodenal Regurgitation: Control of Pylorus. F. L. Apperly.—p. 111.
*Serum Magnesium in Relation to Menstruation: Calcium. E. Watchorn.—p. 120.
*Anticoagulant Action of Herudin. J. O. W. Barfratt.—p. 127.
*Effect of Clotting and of Sodium Citrate on Bactericidal Power of Blood. V. G. Walsh and D. Harmsworth.—p. 129.
*Tetanus in Horse Subsequent to Prophylactic Immunization: Revaccination. A. T. MacConkey.—p. 133.
*Physiologic Action of Colloids. II. D. B. Steabben.—p. 141.
*Van den Bergh Reaction in Diabetes Mellitus. I. M. Rabinowitch.—p. 155.

Fever, Infections and Thyroid-Suprarenal Apparatus.—Evidence is presented by Cramer to show that an aseptic fever is the result of certain pathologic conditions involving hyperactivity of the thyroid and the suprarenal glands. Examples are exophthalmic goiter and suprarenal hemorrhage. Clinically, these conditions closely resemble bacterial infections, and are frequently mistaken for such. Suprarenal hemorrhage, in particular, is hardly if ever diagnosed during life, and is usually mistaken for an acute bacterial infection. It is probable that many of the so-called pyrexias of unknown origin are due to disturbances of these two glands. Some therapeutic applications of this conception are discussed, and it is suggested that it affords an explanation for the nonspecific vaccine and protein therapy.

Serum Magnesium and Menstruation.—Fourteen women were examined by Watchorn. Women who had no premenstrual pain or other symptoms showed no change in serum magnesium. There was an increase in the serum magnesium when pain was present, and a decrease when there was premenstrual malaise without pain. Taking magnesium acetate during the week preceding menstruation apparently caused ovarian irritation, but was on one occasion followed by an unusually normal menstrual period. Very little change, or no change at all, was found in the serum calcium.

Anticoagulant Action of Herudin.—Experiments made by Barratt to determine the effect of herudin on fibril formation in citrated fibrinogen solution (blood plasma) show that herudin: (1) acts on thrombin, which becomes diminished in amount, and (2) is without action on fibrinogen.

Bactericidal Power of Blood.—The effects of sodium citrate and of coagulation on the bactericidal power of the blood were investigated by Walsh and Harmsworth. The coagulation of blood enormously increases its bactericidal power. Citrate inhibits the growth of staphylococcus in blood.

Prophylactic Immunization Against Tetanus.—Experimental and clinical data are supplied by MacConkey which suggest that a course of prophylactic inoculations of tetanus toxin, totaling some 400,000 minimal lethal doses, cannot be relied on in every case to protect horses against tetanus for more than three years. About this period the antitoxin content of the blood would appear to be on the borderline of safety.

Physiologic Action of Colloids.—It is shown by Steabben that the injection of colloidal substances into normal rabbits may temporarily increase phagocytosis, and also the bactericidal power of whole blood and serum, but these effects are not constant. Experimentally infected animals lose the power to respond to this stimulation as the infection advances. The injection of a colloidal substance into an animal suffering from an acute infection may cause a fatal reaction, analogous to "shock"; if the animal is in an advanced chronic stage of disease the injection of a colloid may cause a marked focal reaction, and appears to aggravate the condition; in the early stages such an injection seems temporarily to delay the course of infection.

Van den Bergh Reaction in Diabetes.—The van den Bergh reaction was applied by Rabinowitch to a group of persons with biliary disease. The incidence of positive reactions found suggested that the liver escapes injury in a minority of cases only. Of a group of 130 diabetic patients, positive van den Bergh reactions were found in thirty-four. Rabinowitch suggests that the routine performance of the van den Bergh test may be of assistance in the prevention of diabetes. As with all other laboratory tests, it is of value only when properly interpreted. For the latter purpose, correlation with the clinical picture is essential in order to exclude conditions other than gallbladder disease and pancreatitis (hemolytic processes, heart failure, etc.) which may cause positive reactions.

British Medical Journal, London

2: 1-50 (July 3) 1926

Epilepsies. S. A. K. Wilson.—p. 1.
*Diet and Calcium Content of Saliva. C. L. Pattison.—p. 6.
*Pleural Effusion Complicating Pneumothorax. L. S. T. Burrell.—p. 8.
*Case of Chronic Obstructive Jaundice. F. P. Weber.—p. 9.
Three Cases of Obstruction at Vesical Outlet After Prostatectomy. W. K. Irwin.—p. 10.
*Agglutination of Gonococcus in Man. C. E. Jenkins.—p. 11.
Carcinoma of Prolapsed Cervix. N. A. Macleod.—p. 12.
Hematoma of Abdominal Wall. H. H. Gellert.—p. 12.

Diet and Calcium Content of Saliva.—Pattison asserts that a high calcium content of the saliva can be produced by a diet having a large fat-soluble vitamin content. A low calcium content can be produced by a diet containing much cereal (especially oatmeal) and comparatively little fat-soluble vitamin, although the amount of calcium ingested in this diet may be the same as, or even greater than, in the first mentioned diet. The calcium of the saliva is not increased by increasing the calcium of the diet over a short period. Tuberculous children appear to have a lower calcium content of the saliva than normal children, and, on the whole, low resistance to the infection is accompanied by low calcium content.

Pleural Effusion Complicating Pneumothorax.—Out of 309 consecutive cases in which Burrell successfully induced artificial pneumothorax for pulmonary tuberculosis, an effusion formed in 128 and of these, forty-seven patients are dead. Of the 181 cases in which no fluid formed, fifty-seven patients are dead. Of the 128 cases the fluid remained clear in ninety-two, and in twenty-seven death occurred. In the other thirty-six cases the fluid was tuberculous pus, and twenty patients are dead. Roughly speaking, cases that show clear pleural effusion do neither better nor worse than dry cases, but if a tuberculous empyema forms, the outlook is much more serious.

Chronic Obstructive Jaundice Caused by Adenocarcinoma of Hepatic Duct.—Weber reports a case of chronic obstructive jaundice (complete obstruction) due to primary adeno-

carcinoma of the hepatic duct at its junction with the cystic duct. The man, aged 62, died after having had jaundice for only about one month. He had had occasional hematemesis, but at the postmortem examination no lesion was found in the esophagus, stomach, or upper bowel to account for it. The adenocarcinomatous growth was small and macroscopically scarlike. No metastases were seen. On microscopic examination sections of the liver were found to contain numerous foci, recalling by their small size and their irregular distribution the focal necroses of infectious diseases (typhoid fever, etc.). They were distributed in various parts of the hepatic acini and contained necrotic liver cells and bile pigment; in many of them there were also quantities of large phagocytic cells (macrophages), and in some of them there were also collections of polymorphonuclear leukocytes, as if suppuration were threatening. There had been no fever during life. Another point of interest was the enlargement of the spleen. The spleen still weighed 770 Gm. It was evenly enlarged, of rather firm consistency, and on section a myeloid transformation was found.

Agglutination of Gonococcus.—An investigation was made by Jenkins of the serology of the gonococcus. It was evident that agglutinins to the gonococcus are not produced in man when the infection is limited to the genito-urinary system. In a generalized infection such as arthritis, the amount of agglutinin produced is so small and uncertain that the agglutination test as ordinarily performed is of no value for diagnostic purposes.

"Gann," Japanese Journal of Cancer Research, Tokyo

20: 21-35, 1926

*Antibody Formation in Experimental Carcinoma of Mouse. K. Yamagiwa, S. Tsukahara and S. Morimoto.—p. 21.
*Filtrable Cells of Rous Chicken Sarcoma. W. Nakahara.—p. 27.
Radiotherapy of Malignant Tumors. H. Yamakawa.—p. 33.

Antibody Formation in Experimental Carcinoma.—By means of intratumor injections of an aqueous extract of the spleen of a mouse previously inoculated with the emulsion of a mammary carcinoma, Yamagiwa et al. were able to inhibit the growth of a transplanted carcinoma. It is believed that a carcinoma antibody is responsible for this effect as the spleen extract of an animal not previously treated with mammary cancer emulsion had no inhibitory effect; nor did weak solutions of phenol or physiologic sodium chloride solution inhibit.

Filtrable Cells of Rous Sarcoma.—Nakahara has discovered that the Rous chicken sarcoma no. 1 contains a group of minute ameboid cells which readily pass through bacteria-tight Berkefeld filters (V and N). This fact, taken together with the remarkable resistance of the sarcoma cells to desiccation and to glycerination, renders it possible to explain many peculiar phenomena connected with the transmissibility of this class of tumors, without assuming the hypothetic causative agent, which for a long time dominated the thoughts of investigators. Chicken sarcomas can no longer be regarded as etiologically different from the true neoplasms.

Lancet, London

2: 1-52 (July 3) 1926

Cholecystography. S. Cade.—p. 1.
Health of Professional Women. L. Fairfield.—p. 5.
*Conduct and Fate of Ligature Made from Parietal Peritoneum of Ox. C. Ballance.—p. 10.
Action of Light on Eye. III. Retina. W. S. Duke-Elder.—p. 16.
Cholecystography. T. I. Bennett, A. M. Moncrieff and F. G. Nicholas.—p. 19.
*Measles Showing Unusual Nervous Symptoms. J. Todesco.—p. 21.
Case of Renal Calculus. A. C. S. Gupta.—p. 21.
Fracture of Anatomic Neck of Humerus Without Apparent Direct Violence. F. M. Blumer.—p. 22.

Fate of Ligatures Made from Parietal Peritoneum.—Ballance recommends the use of peritoneal ligatures instead of catgut or kangaroo tendons. His experiments show that the peritoneal ligature is particularly well adapted for this purpose, especially if chromicized, which delays the absorption of the ligature and is in no way surgically disadvantageous. When all the ligature has been absorbed and replaced by the living cells, the latter lose their pristine flexibility of form, become spindle shaped, and spin fibrous tissue. The outline of the original dead material of ligature can be recognized by the shape and size of the fleshy mass of new living tissue which has been substituted for it.

Measles Showing Unusual Nervous Symptoms.—The points of interest in Todesco's case are the nervous complications, with marked meningeal symptoms, fits and Kernig's signs, all very uncommon in measles. The character of the cerebrospinal fluid obtained was similar to that seen in acute meningitis but, unlike this disease, there was rapid improvement with loss of meningeal symptoms within forty-eight hours of their onset, the temperature never rising above 100 except on the day of admission, and coming down to normal after four days.

2: 53-106 (July 10) 1926

Nontuberculous Infections of Kidney. H. Cabot.—p. 53.
*Unilateral Phrenic Paralysis. C. Briscoe.—p. 56.
*Effects of Primary and Secondary Roentgen Rays on Skin of Frog Tadpole. H. Colwell and M. S. Thomson.—p. 59.
Syphilis of Heart and Aorta. F. W. Price.—p. 61.
*Acute Hemorrhagic Pneumonia of Infants. W. P. H. Sheldon.—p. 64.
Heart Disease and Epilepsy. R. O. Moon.—p. 65.
Loss of Orientation in Insured Workmen: Economic Aspect. P. Dunn.—p. 66.

Unilateral Phrenic Paralysis.—Considering all points together, it seems clear to Briscoe that cases of complete unilateral paralysis occurring in young patients with free thoracic movement will provide a typical appearance of inverse movement and elevation. In older patients, in whom the thorax is more fixed and the lungs less elastic, the appearances will be less marked. Cases of partial paralysis, on the other hand, cannot be expected to present a precise diagnostic picture, but will yield apparently indefinite results. This explains the varied reports received about many of Charlton Briscoe's patients, and leads to the final conclusion that a majority of the cases encountered in clinical work are instances of partial—not complete—paralysis.

Effects of Roentgen Rays on Skin.—Tadpoles were exposed by Colwell and Thomson to the general beam of mixed radiations from admixed colloidal elements. The effect of exposure to the primary roentgen rays from the tube (in the absence of any added colloid) is to produce a fairly marked temporary hypertrophy followed by degeneration. Yet, taking these factors into account, it would appear that the secondary radiations from copper are mainly destructive in character, as are also those of selenium, though here the destructive changes are less apparent and the evidences of temporary hyperplasia are more marked. In contrast to these changes are the effects produced by irradiation in the presence of colloidal silver, when the hypertrophic changes are predominant and exceed in amount those produced by irradiation in the presence of any other colloid used, while their persistence is also equally striking. Irradiation in the presence of colloidal gold (5 per cent mixture) also produced marked hypertrophic changes, more especially on the limbs and tails of the embryos. Next to those caused by irradiation in the presence of silver, these were the most marked hyperplastic changes observed. In the lead and bismuth series, hyperplasia was less marked and disappeared sooner than in the silver or gold series. The results suggest that the extraordinary hypertrophic changes due to irradiation in the presence of colloidal silver are due to some special action of some of its characteristic radiations; and as these changes are still very well marked in the case of gold, that probably some series of wave lengths are specially concerned in producing this hyperplasia.

Acute Hemorrhagic Pneumonia of Infants.—Sheldon's patient was a prematurely born baby. A blood stained nasal discharge twelve hours after birth was the first symptom. The temperature was subnormal, 96 F. Excessive persistent vomiting was the only other symptom. The baby died on the fourth day. There were no thrombi in the main vessels at the roots of the lungs. Sheldon is of the opinion that prematurity is an etiologic factor in these cases. In four of six cases on record the baby was born prematurely.

Annales de Médecine, Paris

19: 457-551 (May) 1926

Dick Test and Immunity Against Scarlet Fever. R. Debré et al.—p. 457.
*A Form of Hypertrophic Neuritis. A. Souques.—p. 484.
*Heart Insufficiency of Peripheral Origin. A. Dumas.—p. 497.
Adenoma of Liver Without Cirrhosis. Cathala and Delagénière.—p. 506.

Atypical Form of Progressive Hypertrophic Neuritis.—In Souques' patient, a woman aged 58, a bilateral and symmetric amyotrophia of all the limbs was accompanied by fibrillary twitching, electric changes, abolition of reflexes and slight anesthesia. The affection started with atrophy of the muscles in the legs at the age of 2, entailing pronounced deformity of the feet. She was able to walk, however, until the age of 40, when crutches became necessary, and the hands became crippled six years later. There were no signs of a tabetic type or of multiple sclerosis or kyphoscoliosis. Hypertrophy of the peripheral nerves was the outstanding feature. In cases of muscular atrophy, the possibility of hypertrophic neuritis should be borne in mind; palpation of the peripheral nerves may reveal their abnormal size. Otherwise the true nature of the amyotrophia may be unrecognized. The origin of this peculiar form of hypertrophic neuritis is still unknown, and treatment so far has been futile. The woman's general health is good and the cerebrospinal fluid is apparently normal except for a very slightly positive Wassermann reaction.

Disturbances or Insufficiency of the Heart and Asystolia of Peripheral Origin.—Functional disturbances of the heart may be entailed not only by resistance to the flow of blood in peripheral vessels but also by widening of the lumen, as with an aneurysm. With both arterial hypertension and hypotension, the overwork of the heart may entail hypertrophy of the organ with consecutive insufficiency. According to Bard, the hypertrophy from arterial hypertension is a concentric one, and is connected with the mechanism of the systole, while that from arterial hypotension is excentric, associated with the mechanism of the diastole. Profuse hemorrhages may induce a syndrome simulating aortic insufficiency in persons with defective vasoconstriction. This was observed in two patients with atheromatous arteries. Vascular spasms may induce changes of the heart rhythm, palpitations, or an angina pectoris syndrome. Digestion, strain, exposure to cold, hepatic or nephritic colics, also tabetic visceral pains may be responsible for extrasystoles, due to an increase of the blood tension with involvement of the intracardiac centers. Paroxysmal vasodilatation, shock therapy or infectious diseases may cause attacks of tachycardia, owing to suprarenal insufficiency or inhibition of the sympathetic. Primary arterial hypotension, connected with disturbances of the suprarenal, thyroid or genital glands may induce tachycardia, sometimes even arrhythmia of the extrasystole type. It may also finally entail dilatation of the heart with signs of insufficiency. While essential cardiac insufficiency calls for digitalis, on the other hand, vasodilator or vasoconstrictor medication is indicated in insufficiency of peripheral origin.

Archives Médicales Belges, Brussels

79: 193-240 (May) 1926

Cholecystography. H. M. Toussaint.—p. 193.
Technics for Blood Transfusions. Lemmens.—p. 197.

79: 241-288 (June) 1926

*Vaccine Therapy of Ear Affections. H. M. Hemeleers.—p. 241.
Postoperative Acidosis and Insulin. L. Birck.—p. 246.
Fractures of the Acromion. Ory.—p. 250.

Vaccine in Treatment of Affections of the Ear.—Hemeleers had excellent results from vaccine therapy of furunculosis in the auditory canal. He declares that this is the sovereign remedy, as he has demonstrated in numerous cases, some long rebellious to other measures. As soon as pus has formed, he makes a deep and wide incision, and a drop of pus is used for preparation of an autogenous vaccine. A dose of 0.25 cc. is injected subcutaneously the first day; 0.5 cc. the second, 1 cc. the third and the next three or four days. By this time the healing was complete, while under the usual measures the affection usually persisted long and was liable to recur. Vaccine treatment was also effectual in suppurating hematomas of the external ear. After the sac was cleaned out, it was filled with bouillon vaccine for ten minutes; then emptied and packed with gauze impregnated with the same vaccine. A dressing was applied above. This was repeated daily, for a few days. A case is described of a large suppurating hematoma of the external ear in which the pus disappeared entirely after three applications of a bouillon vaccine. The cure was complete by the tenth day, and there was very little disfigurement of the ear.

Bulletin de l'Académie de Médecine, Paris

95: 603-630 (June 22) 1926

The Last Smallpox Epidemic in France. L. Camus.—p. 607.
Smallpox in Switzerland, England and the United States. A. Netter.—p. 616.
Smallpox in Paris in 1925-1926. Tanon.—p. 622.
Vaccination Against Smallpox in Paris. Guilhaud.—p. 624.
*Reverse Sequence of Heart Contractions. E. Géraudel.—p. 627.

Consequences of Interference with the Blood Supply of the Conducting Apparatus of the Heart.—Géraudel had under observation for a year a syphilitic man, aged 63, presenting aortitis with a double murmur over the base. He died from a syndrome of mitral insufficiency. Repeated electrocardiograms had shown that the onset of the contraction of the ventricle preceded always that of the auricular contraction. The retarded contraction of the auricle suggested a decreased blood supply from the artery nourishing the auricular portion of the conducting apparatus. Necropsy revealed that the obstacle was located where this artery branched from the right coronary. A patch of pronounced endarteritis in the coronary at this point was responsible for the stenosis. The reverse sequence of the cardiac contractions could not be detected otherwise than by electrocardiography. A similar obstruction to the circulation in the artery of the ventricular portion of the conducting apparatus may cause the Adams-Stokes syndrome.

Bulletins de la Société Médicale des Hôpitaux, Paris

50: 1003-1099 (June 18) 1926

Insulin in Diabetic Xanthoma. A. Chauffard and P. Brodin.—p. 1003.
Perforation of Lung in Pneumothorax. Bernard et al.—p. 1007.
Hypertrophic Osteo-Arthropathy. L. Ramond and Bascourret.—p. 1015.
*Familial Hemolytic Jaundice. R. Debré et al.—p. 1023.
Iodine Treatment of Chronic Rheumatism. Thiroloix et al.—p. 1033.
*Serum Neuritis. O. Crouzon and P. Delafontaine.—p. 1049.
Dislocation of Both Shoulders in Tabes. Crouzon et al.—p. 1051.
*Sympathectomy for Angina Pectoris. Sicard and Lichtwitz.—p. 1053.
Hypertrophic Osteodermopathy. M. Labbé and Renault.—p. 1065.
*Xanthoma Versus Gout. A. Gilbert et al.—p. 1067.
Venous Tension in Peptone Shock. A. Ricaldoni and J. C. Pla.—p. 1072.
McClure and Aldrich Test in Peptone Shock. Idem.—p. 1077.
Stenosis of the Bronchi. E. Rist et al.—p. 1082.
Infected Pulmonary Edema. G. Caussade and A. Tardieu.—p. 1085.

Congenital and Familial Hemolytic Jaundice.—In Debré, Lamy and Baudry's case, a grave anemia developed suddenly in a boy, aged 12, and in a few days it was followed by hemolytic jaundice. The mother had had two attacks of acute anemia, succeeded by a permanent syndrome of hemolytic jaundice. This disease is also present in a little brother and in an uncle. The patient's sister has an enlarged spleen, but no anemia or jaundice. A cousin presents a slight jaundice with splenomegaly. Enlargement of the spleen was a common symptom in all these patients. The Wassermann test was slightly positive in four; nevertheless syphilis is not considered as an unquestionable etiologic factor.

Neuritis from Tetanus Antiserum.—Crouzon and Delafontaine observed a case of polyneuritis with partial paralysis of both arms consecutive to preventive injection of tetanus antiserum. This paralysis seems to be close to the radicular paralysis of the Duchenne-Erb type. Notwithstanding treatment with electricity and strychnine, the sensory disturbances and the anesthetic area still persist after two and a half months.

Bilateral Cervical Sympathectomy for Angina Pectoris.—Sicard and Lichtwitz report the results of this operation in a patient, aged 53, who had occasionally presented severe attacks of angina pectoris for several years. The pains subsided after each intervention, but only for a short time; then they reappeared in the sternum region, even worse than before. There was also evidence that the operation had

induced heart insufficiency, which disappeared under digitalis. Although the relief in this case was only transient, Sicard and Lichtwitz nevertheless advise partial sympathectomy in angina pectoris rebellious to other measures. The Daniélopolu or Leriche method should be used, under local anesthesia.

Familial Xanthoma Simulating Gout.—Gilbert, Chabrol and Bénard's patient, aged 18, presented multiple tophi beneath the skin of the limbs, also intradermal xanthomas profusely disseminated over the body. The tophi first appeared at the age of 4. The number of them gradually increased without causing any pain. The young man did not present any signs of gout or rheumatism. In roentgenograms, the semilunar cartilages and bones seemed to be intact. The nodules proved to be composed exclusively of cholesterol. Blood examination showed a considerable increase of cholesterol. The coexisting hypoglycemia may explain the failure of insulin treatment, continued for about ten days, in this case. Investigation revealed the presence of xanthoma growths in four generations of the family. In fourteen members of the fourth generation, the xanthoma patches started at the age of 4.

Echo Médical du Nord, Lille

30: 370-384 (June 26) 1926

*Intradermal Test in Echinococcosis. C. Gernez.—p. 370.

Intradermal Test in Diagnosis of Echinococcosis.—Gernez emphasizes that the reaction to intradermal injection of the fluid of a hydatid cyst is an exact and rapid method for diagnosis of echinococcosis. It is frequently more reliable than the usual serologic tests. The reaction was positive in his three cases in which the diagnosis was confirmed by an operation, and it was never positive in patients free from hydatid disease. Others have reported accurate responses in from 68 to 100 per cent in nearly 200 cases. The fluid for intradermal injections can be taken from a human hydatid cyst as well as from cysts in oxen or sheep. From 0.2 to 0.6 cc. of the fluid is usually injected into the skin. The same dose of physiologic salt solution should be injected in the other arm for control. In positive cases, the reaction becomes visible in ten or fifteen minutes; it develops into a large erythematous patch within a day, and persists for three or four days.

Journal de Chirurgie, Paris

27: 529-672 (May) 1926

*Amputation of the Rectum in Women. B. Cuneo and Bloch.—p. 529.
Perineal Hernias. R. Chabrut and G. Menegaux.—p. 555.

Amputation of the Rectum in Women.—Cuneo and Bloch emphasize that the operation must be different in the two sexes. They describe their technic as applied in twenty women with cancer of the rectum. The operation is in two sittings. The first aims to establish in the left iliac fossa a permanent and continent artificial anus. The lower end of the intestine is closed completely and is left loose in the abdomen. They open the artificial anus the sixth day and then wait two or three weeks before completing the removal of the rectum. At the second operation, the excluded rectum below the artificial anus is removed entire. This can be done by way of the perineum or abdomen, or by the two combined. The shock is minimal with this two-stage method. They did not observe any postoperative accidents. Seventeen illustrations of the technic are added.

Paris Médical

61: 1-32 (July 3) 1926

Diseases of Heart and Vessels in 1926. Lereboullet and Heitz.—p. 1.
Sclerosis of the Pulmonary Artery. H. Vaquez.—p. 15.
*Causes of Duroziez' Disease. Merklen.—p. 21.
The Heart in Malaria. E. Benhamou.—p. 25.
Reasons for Failure of Heart Tonics. R. Giroux.—p. 28.

Pathogenesis of Pure Mitral Stenosis.—Merklen insists that Duroziez' disease is not congenital, nor hereditary. Nor can the affection be ascribed to syphilis or tuberculosis. It is caused by chronic infection, generally of the rheumatic type. He found rheumatism in the history of twenty-four of his thirty-two patients with mitral stenosis; chorea was superposed in four instances. The affection occurs mostly in women with endocrine derangement, involving especially the thyroid gland. There seems to be coincidence of Duroziez' disease with certain dystrophic disturbances. The rheumatic infection may thus be the cause of mitral stenosis in persons with defective metabolism.

Presse Médicale, Paris

34: 833-848 (July 3) 1926

Fluorin Cachexia in Man. H. Cristiani.—p. 833.
*Osteomalacia in the Young. J. Dereux.—p. 834.

Osteomalacia in a Young Girl.—Dereux describes with illustrations a case of extreme osteomalacia from early infancy in a girl, now aged 17. The softness of the bones has entailed deformity of the thorax, spine and limbs. Analysis showed the anomaly of the bones to be due to deranged metabolism, chiefly of calcium and phosphoric acid. Spontaneous fractures were frequent; but contrary to what is observed usually in osteomalacia, consolidation proceeded normally. Attacks of spontaneous pains occurred every winter, lasting for two or three months. The localization of the pain in the limbs seems to be characteristic for osteomalacia in children. Roentgenograms showed the presence of calculi in both kidneys and bladder, revealed clinically only by pyuria. There may be a connection between the formation of these calculi and the disturbed mineralization of the bones. Congenital syphilis may have played a secondary rôle, enhancing the influence of a still unknown factor. The usual treatment failed. Dereux queries whether ultraviolet rays might not have arrested the process if they had been applied in the beginning.

Schweizerische medizinische Wochenschrift, Basel

56: 585-608 (June 19) 1926

*Intramedullary Tumors. F. de Quervain.—p. 585.
*Local and Humoral Immunity. G. Sobernheim.—p. 588.
*Benign Acute Lymphocytic Meningitis. M. Roch.—p. 591.
*Occupational Paralyses. F. Seiler.—p. 594.
Interruption of Pregnancy. E. Frey.—p. 597.
Deforming Osteitis and Similar Diseases. E. Looser.—p. 598.
*Experimental Idiosyncrasy to Nickel. B. Walthard.—p. 603.

Intramedullary Tumors.—De Quervain reports on two cases of a tumor in the spinal cord. The outlook for surgery is worse than in extramedullary cases (52 per cent mortality against 25 per cent, according to Lennep).

Local and Humoral Immunity.—Sobernheim does not believe in any antagonism between the immunity of tissues and of the blood. Antibodies have been found in the serum even in various forms of smallpox infection. The immunization of animals by mouth succeeds only as it induces humoral antibodies. The doses necessary for oral immunization do not differ from those which have to be used in parenteral injections. The apparent rapidity of immunization by mouth is due only to the fact that ingestions of various bacilli cause a nonspecific increase in resistance. The specific protection develops just as late as after injections.

Benign Acute Lymphocytic Meningitis.—Roch observed some cases of benign acute meningitis with a high lymphocyte content of the cerebrospinal fluid. Lumbar punctures had a favorable effect.

Occupational Paralyses.—Seiler reviews occupational paralyses occurring in overstrained groups of muscles, and reports an instructive case.

Experimental Idiosyncrasy to Nickel.—Since practically every worker occupied with nickel plating suffers sooner or later from eczema, Walthard selected nickel salts for experimental production of idiosyncrasy in guinea-pigs. He succeeded, although the animals showed considerable individual differences. When he reapplied nickel salts after the first eczema had healed, the reaction occurred much quicker than after the first application, even when a different part of the skin was used. The eczema flared up temporarily in some of the animals after subcutaneous injections of 1 cc. of a 0.1 per cent solution of nickel sulphate at a part remote from the eczema. Intravenous injections induced no shock, but a moderate shock was observed after subcutaneous injections in animals that had nickel eczema. This shock was followed by rapid recovery from the eczema in spite of continued application of the salt. Skin tests failed.

Policlinico, Rome

33: 281-332 (June 1) 1926. Medical Section

Glioma of Parietal Lobe. F. Giannuli.—p. 281.
The Thalamic Syndrome. F. Costantini.—p. 298.
Encephalography and Lipiodol. M. Gortan and G. Saiz.—p. 312.
"Amebic Liver Abscess." La Cava.—p. 329. Reply. Pontano.—p. 331.

Riforma Medica, Naples

42: 433-456 (May 10) 1926

Agglutination in Malta Fever. G. Izar.—p. 433.
Eunuchoidism from Acquired Syphilis. E. Mariotti.—p. 433.
Neurovegetative Syndromes of Influenzal Origin. A. Guerricchio.—p. 450.

Archivos de Endocrinología y Nutricion, Madrid

4: 57-103 (April) 1926

*Heart Disease in Diabetics. C. Blanco Soler.—p. 57.
Share of Nitrogen in Contraction of Muscle. V. Calvo Criado.—p. 68.
Case of False Addison's Disease. Pardo de Urdapilleta.—p. 77.
Pituitary and Diuresis. C. Blanco Soler and Pardo.—p. 83. C'cn.

Heart Disease in Pregnant Diabetic.—Blanco Soler gave small doses of insulin (20 to 40 units) daily to a diabetic woman with acidosis, a mitral murmur and cardiac insufficiency, at the seventh month of her third pregnancy. She was unable to sleep reclining, and the 3 or 4 liters of urine contained considerable glucose, besides quantities of acetone, diacetic and beta-oxybutyric acid. By the second day after beginning the insulin treatment, the general health improved remarkably and the heart recuperated, the pregnancy progressing to normal delivery. The improvement continued afterward, the woman now tolerating 80 Gm. of sugar, without insulin, and the general condition is completely satisfactory. He believes that heart disease is more common in diabetics than is generally recognized, and that it is often responsible for the fatalities after subsidence of the glycosuria and acidosis. In the case described here, the heart had not responded to the usual measures and stimulants but it promptly recuperated after it had been freed from the toxic action of the acidosis and was able to take nourishment from the blood. This seems to be impossible with hyperglycemic blood. The insulin had further a favorable action on the vagus.

Archivos Españoles de Pediatría, Madrid

10: 321-384 (June) 1926

*Prognosis of Tuberculosis in Infants. A. Romeo Lozano.—p. 321.
*False Green Diarrheas. P. Pereda y Elordi.—p. 335.
Dextroversion in Boy Aged 12. J. Soria.—p. 347.

Tuberculosis in Infants.—Romeo Lozano analyzes 114 cases of tuberculosis in infants, including sixty-four under 12 months. The death rate in this last group was 26.5 per cent, while it was only 12 per cent in infants up to 2 years; 5.2 per cent succumbed to nontuberculous affections. None of the infants had been removed from the infected environment; 23 per cent of the breast-fed died, and 38 per cent of the bottle babies. The defensive forces are not developed in the new-born, and consequently the prognosis is almost inevitably fatal in the younger infants. Hygiene and dietetic conditions have the greatest influence on the course of the tuberculosis.

True and False Green Diarrheas in Infants.—Pereda y Elordi ascribes the green diarrhea in certain cases to the swallowing of air. The compression from the air induces colic which may be relieved by expulsion of the air. As the air is expelled at intervals, it carries with it green stool, and thus is produced the clinical aspect of green diarrhea. If the infant's lips do not fit close to the nipple it is liable to swallow large amounts of air, as also in sucking its fingers, and in the sucking movements made by infants that are not getting enough nourishment. Although the mother's milk is the best food for the infant, her nipples may not be the best; two children may nurse the same breast but one will have green stools, the other not, although both may be gaining evenly in weight. When colics are relieved by expulsion of gases, and when the green stools react to nitric acid, aerophagia can usually be incriminated if the child is gaining in weight. True green diarrhea is alkaline, even with breast feeding, and there is fever. It is rare, does not react to nitric acid, and it yields to lactic acid. Infants that swallow much air, that have a wide pylorus, should be given a chance to expel the air in the stomach at intervals during the breast or other feeding. They should not be fed in a horizontal position, as this hinders eructation of swallowed air. He describes a number of cases of false green diarrhea and their correction by simple wise hygiene, quoting Cocetti's remark that infants have more to fear from ignorance than from disease.

Archivos Latino-Amer. de Pediatría, Buenos Aires

20: 199-262 (April) 1926

*Tuberculous Peritonitis. J. Schwarzenberg and Steeger.—p. 199.
*Differential Diagnosis Between Spinal Cord and Paravertebral Lesions. A. M. Marque.—p. 231.
Diphtheric Paralysis. J. Damianovich.—p. 242.

Tuberculous Peritonitis. — Schwarzenberg and Steeger describe eight cases of this disease in children between 3 and 8, under observation at the children's hospital at Santiago. Except in two of the cheesy type, great improvement followed a two or three months' course of treatment with various measures, including an arsenical, ultraviolet rays, and general hygiene. The prognosis is more favorable when the coexisting pleural or tracheobronchial processes are of a mild type than when there are signs of a cheesy pulmonary process. The tuberculin test is also useful. They emphasize that a laparotomy is applied usually only in the cases with ascites, and this type of case tends naturally to spontaneous recovery. Conservative treatment is therefore indicated; six of these children left the hospital in satisfactory condition.

Iodized Oil in Differential Diagnosis of Spinal Tumors.—Marque has applied lipiodol in six spinal cases in children and has found it instructive and free from by-effects at the time or later. Serial roentgenograms from a girl, aged 10, are reproduced. Three injections of the iodized oil had been given and they allowed clearing out of a costovertebral abscess compressing the spinal cord, with almost complete recuperation of function.

Archivos de Med. Cirugía y Esp., Madrid

24: 577-624 (June 26) 1926

*Uremia and Acid-Base Balance. Mogena and Orcoyen.—p. 577.
Fröhlich's Adiposogenital Infantilism. M. Prados y Such.—p. 590.

The Acid-Base Balance in Case of Retention of Urea.—Mogena and Orcoyen found that the urea content of the blood and the alkali reserve were closely connected in forty-three patients with diseased kidneys. The lowest figure for the alkali reserve was 13.9 per cent in two patients who succumbed to their nephritis in a few hours. The urea content of the blood was 0.064 and 0.160 per cent. In every case of uremia the acid-base balance was deranged, the alkali reserve declining. The prognosis of nephritis with retention of urea does not depend so much on the amount of urea in the blood as on the degree of acidosis. Too great depletion of the alkali reserve is inevitably fatal. They advise a diet rich in fruits and vegetables as an aid in restoring the acid-base balance in nephritis.

Boletin Soc. de Obstet. y Ginecol., Buenos Aires

5: 63-133 (May 30) 1926

Case of Krukenberg Tumor. J. C. Ahumada.—p. 71.
*Forceps at the Superior Strait. R. Schwarcz.—p. 83.

Forceps at the Superior Strait.—This profusely illustrated article and the discussion deal with the application of the Kjelland forceps, especially to the superior strait. Schwarcz emphasizes that with a relatively contracted pelvis, all forceps are contraindicated; symphysiotomy should be preferred for primiparas. Palacios Costa said he had had two or three failures in the ten or fifteen cases in which he had used the Kjelland. Beruti stated that in certain cases in which the Naegele forceps had failed, the Kjelland proved ineffectual also, and in several cases in which the latter had failed, he succeeded with the Naegele.

Brazil-Medico, Rio de Janeiro

1: 263-274 (May 15) 1926

*Clinical Meteorology. Annes Dias.—p. 263.

Pathogenic Influence of Meteorologic Disturbances.—Annes Dias comments on the surprising disregard shown by modern

textbooks as to the pathogenic influence on the sick of cosmic electricity, terrestrial magnetism, radiobiology and the weather in general. Rheumatism, asthma and heart and mental diseases are affected by weather conditions. His attention was attracted to the subject by the exceptional number of deaths from heart disease and typhoid recorded at Rio during the turbulent equinoctial storms of last fall and spring. Some of these patients had been apparently doing well until this period of low barometric pressure and electric phenomena. We appreciate the force of these cosmic influences when they act suddenly, in the form of the lightning stroke, but a long continued milder action may be almost equally destructive in time.

1: 275-284 (May 22) 1926

*Treatment of Leprosy. Antenor Machado.—p. 275.
Topical Use of Bismuth in Bergeron's Stomatitis. B. Pedral Sampaio.—p. 277.

Oil of Brazilian Tree in Treatment of Leprosy.—Machado has been making a special study of the oil from the tree *Carpotrochea brasiliensis* which resembles chaulmoogra oil in certain respects. It has been used quite extensively lately in the treatment of leprosy, with eminently satisfactory results, he says. The reaction is not so severe as with chaulmoogra oil, perhaps because the acids in the ester are not so rich in methyl radicals. The tree is known locally as the sapucainha, canudo de pito or papo de anjo, and an extract from it is a household remedy for skin diseases.

Gaceta Médica de México, Mexico City

57: 131-278 (April) 1926

*Blunders in Diagnosis. Ulises Valdes.—p. 131.
*Uncontrollable Laughter. E. O. Aragón.—p. 142.
Chronic Obstruction of Common Bile Duct. M. Godoy Alvarez.—p. 147.
*Treatment of Glaucoma. A. F. Alonso.—p. 158.
Insulin in Treatment of Diabetes. M. Quiñones.—p. 181.

Blunders in Diagnosis.—Valdes confesses that the operation showed that the diagnosis had been incorrect in 6.2 per cent of 127 operative cases during 1925. In some of them the examination had been incomplete, and in the others the symptoms had been erroneously interpreted. In one case the possibility of a pregnancy seemed out of the question, and a fibroma was diagnosed. In another, torsion of the pedicle of a fibroma and its cylindric shape had suggested salpingitis. A cancer in the gallbladder had masqueraded as gallstone disease, in another case. Only in one instance would the operation have been different if the true condition had been recognized; this was in a case of fungoid endometritis. The uterus was amputated on the assumption of fibromas.

Uncontrollable Laughter.—The young woman had been laughing incessantly for seventeen hours. A subcutaneous injection of a sedative then did not arrest the laughing, which was pure laughter, without complications. Aragón then applied pressure to the ovaries which were tender, the young woman being in the second day of a menstrual period. Under the compression of the ovaries the laughing gradually became attenuated and subsided, the patient dropping to sleep, aided by the sedative.

Treatment of Glaucoma.—Alonso expatiates on the advantages of the Lagrange fistula method in treatment of glaucoma, as he realized them in operating on six patients by this technic. The article is illustrated.

Medicina Contemporanea, Lisbon

28: 177-184 (June 6) 1926

*Syphilis of the Bladder. Pinto Monteiro.—p. 177.
Campaign Against Tuberculosis in Portugal. Cassiano Neves.—p. 182.

Syphilis of the Bladder.—Pinto Monteiro comments on the vagueness of the differential diagnosis in these cases. Pollakiuria is the leading symptom: it is not dependent on menstruation, and does not usually display the tendency to evening exacerbations which otherwise is observed in syphilis. It may be absent, and there may be a roseola in the bladder. When there is no cystitis, the bladder syphilis generally belongs to the tertiary phase or is a manifestation of congenital syphilis. The differential diagnosis has to be based on the exclusion of other causes, and the benefit under antisyphilitic treatment. In two cases described, the syphilis had been acquired in one woman, and the chancre seemed to be in the bladder. The other patient was a virgin with congenital syphilis. The Wassermann test was negative. Both patients were in the twenties, and both recovered promptly under specific treatment.

Prensa Médica Argentina, Buenos Aires

13: 1-56 (June 10) 1926

*Sanocrysin Exanthem. Bonorino Udaondo and Vadone.—p. 1.
Lymphogranulomatosis of the Spleen. Strada and Navarro.—p. 5.
*Christeller's Frozen Section Preparations. S. Mazza.—p. 9.
Bismuth in Aortitis. G. Perrin.—p. 13.
Advantages of Roentgenotherapy for Tuberculous Glandular Disease. M. Miranda Gallino.—p. 21.
Endonasal Plastic Surgery. J. Basavilbaso.—p. 23.
Acute Leukemic Hypertrophy of Lymph Glands with Intense Erythremic Anemia and Hemohistoblastosis. Bianchi and Beretervide.—p. 26.
*The Urine in Syphilis. J. L. Carrera.—p. 44.

Sanocrysin Eruption.—In the case illustrated, a man with pulmonary tuberculosis and no previous skin affection was being treated with sanocrysin when he developed intense gingivitis and stomatitis, with an extensive eruption, predominating on the hands and arms. Similar manifestations have been noted under treatment with other gold salts, and others have reported eruptions in a certain proportion of their sanocrysin-treated cases.

Christeller's Histotopographic Sections.—Mazza expatiates on the advantages and reproduces some of the photographs of preparations obtained by the E. Christeller rapid method which allows the cutting of frozen sections up to 9 by 12 cm. in size.

The Urine in the Syphilitic.—Carrera relates that serial examination of the urine in thirty syphilitics who had never taken treatment before, showed the urea and glucose content normal, but there was albuminuria in 5 per cent and traces of bile pigments and acids in 10 per cent. In twenty-five that had recently been given thorough neo-arsphenamine treatment, the urea and glucose were normal, but there were traces of albumin in 6 per cent and considerable in 2 per cent, and tube casts were present in 20 per cent. In another group of forty-five syphilitics that had been treated with mercury, the urea was subnormal, traces of albumin were manifest in 35 per cent, with considerable albumin in 10 per cent, traces of glucose in 4 per cent, pigments and biliary acids in 22 per cent, and tube casts in 60 per cent.

Archiv für Dermatologie und Syphilis, Berlin

150: 195-374 (May 22) 1926. Partial Index

Psoriasis Vulgaris. B. Lipschütz.—p. 195.
Statistics of Visceral Syphilis. A. Netschaew and B. Eward.—p. 213.
Excretion of Urea Through the Sweat Glands. N. Melczer.—p. 235.
Tertiary Skin and Bone Changes in Neurosyphilis. Prokoptschuk.—p. 261.
Skin Diseases and Physique. O. Gans and H. W. Gruhle.—p. 271.
*Purulent Orchitis of Gonorrheal Origin. H. Salutzky.—p. 300.
Secondary Deforming Syphilitic Arthritis. C. Kreibich.—p. 316.
*Localization of Hematogenous Skin Infections. F. Kogoj.—p. 333.

Purulent Orchitis of Gonorrheal Origin.—Salutzky reports two cases of gonorrhea of the testicle. From the first the organism was cultured; in the second, conditions were unfavorable and the cultures were not typical, but microscopic examination of the pus was convincing. The testicle is rarely invaded by the gonococcus, having a strong protection in the tunica albuginea. Spermin is also believed to have the property of reducing the toxicity of microbic poisons. In his two cases, injury to the testicle had preceded the infection. Eighteen other cases are reported in the literature, but in only two of these was the gonococcus actually demonstrated.

Determining the Localization of Hematogenous Skin Infections.—Kogoj found that injection of internal organs of guinea-pigs and rabbits with a culture of the fungus of mouse favus was followed in most cases by hematogenous foci in unirritated as well as in irritated portions of the skin, but that the foci appeared with greater frequency in the irritated portions. Up to a certain point, it was possible for the experimenter by applying strong irritation to elect the site of the skin lesion.

Archiv für Schiffs- und Tropenhygiene, etc., Hamburg

30: 275-308 (July 1) 1926

*Beriberi. Miguel Couto.—p. 275.
*Methylene Blue in Malaria. Miguel Couto.—p. 281.
*Blackwater Fever. G. J. Perekropoff.—p. 284.
Pathogenesis of Hemoglobinuria in Malaria. Kritschewsky.—p. 293.
Concentrated Sunlight as Adjuvant in Treatment of Chancroid on Shipboard. E. G. Adelmann.—p. 297.

Beriberi.—Couto protests against some recent statements that link beriberi with European polyneuritis. He describes the special features which distinguish it, and emphasizes the preponderant rôle of the vegetative nervous system in the manifestations. In Brazil, beriberi has many features of an infectious disease, especially its epidemic spread, its occasional fulminating form, tendency to dropsy, the girdle sensation, the digestive disturbances at the onset, the circulatory and bladder disturbances, tachycardia, duplication of the second heart sound, gallop murmur and acute insufficiency of the heart, and sometimes the isolated occurrence of visceral symptoms. The rice used in Brazil is identical and is prepared the same all over the country, but beriberi is endemic in the north and is almost unknown in the southern portion. Certain districts and certain buildings are particularly subject to it, and the patients recover as if by magic on change of climate, while the beriberi is liable to return on return to the focus, even if they refrain from eating rice. The majority of the physicians of Brazil believe, therefore, that although a syndrome may occur from rice which resembles beriberi, yet true beriberi, from its course, its distribution and its paroxysms can be only an infectious disease.

Methylene Blue in Treatment of Malaria.—Couto reiterates that methylene blue is a substitute for quinine, and in mild cases can be used instead of the latter. It is especially useful in the cases refractory to quinine. In the tropical or pernicious type of malaria, he advises giving both together from the beginning, by intravenous injection. For this, the dose is 0.05 Gm. of methylene blue in 5 Gm. of water. From two to five doses can be given during the day. He has never witnessed any mishaps from this intravenous injection. In mild cases he gives the drug by the mouth, in capsules containing 0.10-0.20 Gm. to a total of 1.5 Gm. It is taken during the meals to avoid irritating the gastric mucosa. The subcutaneous route is almost certain to cause an abscess.

Blackwater Fever.—Perekropoff describes a case which seems to demonstrate that the malaria parasite itself was directly responsible for the hemolysis. He confirmed this in the test tube in six other cases among sixty-two of tertian malaria. Cultures of malaria parasites developed hemolysins in six to twelve hours; the influence of the liver and spleen was thus excluded, and also the influence of quinine. He treated two patients presenting severe blackwater fever with large doses of quinine, with promptly favorable results.

Archiv für Verdauungs-Krankheiten, Berlin

38: 143-310 (June) 1926

*The Factors in Stomach Disease. W. Kerppela.—p. 143.
Plastic Limitis in Congenital Syphilis. J. Strauss.—p. 186.
The Stomach in the Interdigestive Phase. J. Vándorfy.—p. 198.
*Treatment of Gastric and Duodenal Ulcer. J. Schrijver.—p. 203.
*Regurgitation Into the Stomach. W. Iwanow.—p. 223.
*Gastroscopy with Ulcer. R. Korbsch.—p. 247.
Endoscopy of the Intestines. L. v. Aldor.—p. 271.
*The Anacidity Question. L. Jarno.—p. 290.

Vasomotor and Nervous Factors in Stomach Disease.—Kerppola tabulates the details of seventy cases of achylia and varying conditions of stomach secretion (heterochylia) in which he studied the action of epinephrine and of pilocarpine on the secretory function of the stomach. His research included also eleven cases of subacidity, ten of ulcer with bleeding, eleven of hyperacidity and thirteen of nervous dyspepsia, besides the healthy controls. In one family, two male cousins had died from gastric cancer after years of achylia; two of the children in their families had chronic achylia, as also one granddaughter. He found the healthy stomach empty after twelve hours of fasting. If then 1 mg. of epinephrine was injected intramuscularly, no secretion of gastric juice followed, but if 0.01 Gm. of pilocarpine was injected instead, there was secretion of hydrochloric acid and of mucus, the acidity normal or below. The various tests described demonstrated that spastic conditions and paralysis in the blood vessels of the stomach are responsible for a large proportion of gastric disturbances. If the pathologic condition is mild, nervous dyspepsia is the clinical picture presented. With stronger contraction, subacidity and achylia result. If the paralytic phenomena predominate, hyperacidity and hypersecretion follow. Pronounced spastic and paralytic conditions occurring together, explain ulcer formation. He determined further that instability of the central nervous system and various endocrine disturbances, hyperthyroidism, hypogenitalism and tetany, were responsible for the vasomotor irritability in all the groups studied. Next to these came allergic influences. He obtained positive reactions in many cases to skin tests with dandruff, meat and shellfish extracts, aspergillus or mite-containing oatmeal. The pilocarpine tests revealed weakness of the vagus in many, but occasionally a vigorous reaction was observed. As he had noted that protein therapy tended to reduce vasomotor excitability, he gave this a trial. Distinct subjective improvement followed parenteral injections, and secretory conditions improved in heterochylia, subacidity and hyperacidity. It evidently modified the response to epinephrine; in one ulcer case, in which neither aspiration nor epinephrine had induced any secretion of hydrochloric acid, a profuse secretion followed the protein injection. This testified that our usual tests may give negative responses merely from the fact that the spasm is too strong to yield to ordinary measures.

The Sippy Cure in Gastric and Duodenal Ulcer.—A similar article by Schrijver was summarized in The Journal, Dec. 5, 1925, p. 1848. He says that, in his experience, an operation on the stomach for ulcer cured 95 per cent of those thus treated. This relieved them at the same time of the menace of perforation and hemorrhage. He does not believe that the Sippy cure will do away with the necessity for operations for ulcer.

Regurgitation into Fasting Stomach.—Iwanow's research has confirmed that periodic regurgitation of duodenal contents into the fasting stomach is a physiologic phenomenon. It alternates regularly with resting periods in health, but in disease conditions it may be altered or suppressed. On account of this regurgitation, an alkaline reaction with bile and trypsin in the aspirated fluid is no evidence that the tip of the tube is in the duodenum. Bile has a certain antagonistic action in regard to pepsin, but there is no antagonism between pepsin and trypsin.

Gastroscopy and Ulcer.—Korbsch presents testimony to confirm that chronic gastritis is an important factor, if not the indispensable factor, in the development of a niche-forming ulcer. The evolution and retrogression under treatment can be watched with the gastroscope. Mechanical factors are almost equally important, the ulcer locating at predisposing points in the sagging stomach and duodenum. By systematic lavage and roentgen irradiation he has succeeded in curing the gastritis and its ulcer complication. Although the symptoms promptly subside under the roentgen rays, the gastroscope shows the long persistence of the tissue changes before healing is complete. The rinsing treatment must be kept up for months to insure a permanent cure.

The Anacidity Question.—Jarno asserts that anacidity is generally accompanied by a high cholesterol content in the blood. He regards this hypercholesteremia as an important factor in anacidity.

Dermatologische Wochenschrift, Leipzig

82: 801-840 (June 12) 1926

Chemistry of Bacillus Leprae. A. Paldrock.—p. 801.
*Skin Lesions and Cutaneous Gland Secretions. H. Fischer.—p. 805.
Blastomycosis of the Skin. Grschebin and Maschkilleisson.—p. 811.
C'en. Intramuscular Injections of Sulphonated Bitumen. A. Straszyński.—p. 818.

Importance of Abnormal Secretion of Cutaneous Glands for Pathologic Changes in the Skin.—Fischer found that certain changes in many diseases affecting chiefly the epidermis were paralleled in the local irritation set up by excretion through the cutaneous glands of parenterally administered chemicals.

He concludes that these diseases are caused by pathologically changed secretions of the cutaneous glands, and suggests the same etiology for many skin carcinomas, on the basis of a chronic endogenous chemical irritation.

Deutsche medizinische Wochenschrift, Berlin

52: 1027-1068 (June 18) 1926

*Campaign Against Alcoholism. P. Schmidt.—p. 1027.
Alcoholism and Penal Code. Ebermayer.—p. 1029.
The Practitioner and Biologic Family Research. W. Scheidt.—p. 1031.
*Virulence and Chemotherapeutic Action. H. Kroó.—p. 1032.
Antagonism and Synergism. E. Starkenstein.—p. 1034.
*Leukocyte Counts. V. Schilling.—p. 1034. C'cn.
Organic or Inorganic Iron. Baumgarten.—p. 1037.
Reply. Seyderhelm.—p. 1037.
*Treatment of Pernicious Anemia. E. Hartmann.—p. 1038.
Research in Tuberculosis. Deycke.—p. 1041.
*Treatment with Metal Salts. L. E. Walbum.—p. 1043.
*Nonspecific Sensitization of Skin. C. Kreibich.—p. 1044.
Conglutination of External Os. Rissmann.—p. 1045.
Pyelonephritis with Elimination of Necrotic Part of Kidney. E. Hofmann.—p. 1045.
Gonorrheal Balanoposthitis with Complications. Werner.—p. 1046.
A Quartz Lamp. M. E. Mayer.—p. 1048.
Venereal Diseases in Children. H. Davidsohn.—p. 1048. C'tn.
History of Syphilis. H. E. Sigerist.—p. 1050.
*Anatomic Modeling. J. Brodersen.—p. 1052.
*Plato's Criticism of Physicians. Cassel.—p. 1053.
Medical Yoga Methods. I. Isakowitz.—p. 1054.

Campaign Against Alcoholism.—Schmidt admits that up to 25 Gm. of alcohol in diluted beverages is harmless. People who are not accustomed, may show slight symptoms of intoxication from 50 Gm., while 100 Gm., taken within two hours, always induces grave intoxication in people who are not accustomed to it. He declares that good light wines and beer are the best weapons against alcoholism. He pleads for low taxation of beer with a maximum content of 3 per cent alcohol and of wine with 7 per cent. All the beverages with a higher alcohol content should be taxed higher in a rapid progression, according to the alcohol content. Liquors should be taxed extremely high. He also suggests some legislative matters such as punishing intoxication, interning asocial drunkards, and the declaration that nobody can be sued for a debt incurred by drinking alcoholic beverages. The general propaganda as well as improvement of social conditions would do the rest.

Virulence and Chemotherapeutic Action.—Kroó injected the minimum therapeutic doses of arsphenamine into mice infected with recurrens spirochetes of different degrees of virulence. He found that the more virulent the strain, the more accessible it is to the action of arsphenamine.

Leukocyte Counts.—Schilling demonstrates that differential counts have many advantages over the absolute counts of the single types of leukocytes. In spite of the sources of error involved, they are more constant, more striking and much easier to make. Beside this, it is always possible to estimate the absolute count from a slide.

Treatment of Pernicious Anemia.—Hartmann uses small doses of arsphenamine in treatment of pernicious anemia. He injects 0.075 to 0.15 Gm. intravenously at five to six day intervals, and reports quite satisfactory results.

Treatment with Metal Salts.—Walbum succeeded in preventing the infection of mice by a bacillus of the paratyphoid group by administering salts of caesium and iridium. He made similar experiments on tuberculous guinea-pigs with fifty metals. Thirty-nine of these metals, including gold, copper, manganese and beryllium, had no influence. Three metals did not prevent the development of tuberculosis, yet the animals finally recovered. Eight metals, among them barium, aluminum and selenium, prevented the development of tuberculosis.

Nonspecific Sensitization of Skin.—Kreibich succeeded in sensitizing adults to tuberculin by intracutaneous injections of water.

Anatomic Modeling.—Brodersen extols the advantages of a modeling course in the teaching of anatomy.

Plato's Criticism of Physicians.—Cassel quotes the introduction of Plato's "Charmides": Socrates emphasizes there the necessity of beginning to treat the soul before attempting to treat the body.

Klinische Wochenschrift, Berlin

5: 1113-1160 (June 18) 1926

*Weil's Disease. Uhlenhuth and Grossmann.—p. 1113.
*Therapeutic Serums. A. Schlossmann.—p. 1117.
*Differentiation of Achylias. G. Katsch and H. Kalk.—p. 1119.
*The p_H and Pain. W. v. Gaza and B. Brandi.—p. 1123.
*Buffer Action in Muscle and Circulation. H. Eppinger et al.—p. 1128.
Skeleton of Pes Equinovarus. H. Virchow.—p. 1130.
Factitious Urticaria. E. Rajka.—p. 1132.
Blood Sugar Determination. M. Adler.—p. 1136.
Bronchial Lymph Nodes. S. Engel.—p. 1136.
*Metabolism After Venesection. G. Endres.—p. 1137.
Pluriglandular Symptoms in Tetany. H. Schönemann.—p. 1137.
Diet in Intestinal Diseases. R. Ehrmann.—p. 1139.
*Fragility of Erythrocytes. F. Rietti.—p. 1142.
Improved Capillaroscope. N. A. Skulsky.—p. 1158.

Weil's Disease.—Uhlenhuth and Grossmann review the history of the discovery of the agent of Weil's disease, as well as the further epidemiologic research. It seems that saprophytic spirochetes living in the water may change by repeated cultures, in mediums containing serum, so that they become immunologically identical with the spirochetes of Weil's disease. Zülzer succeeded in producing the typical disease in guinea-pigs with such a strain which had been originally innocuous. It is possible that this change of a saprophyte into a pathogenic germ might occur normally in rats. They admit that some of the epidemiologic problems are not solved by these facts.

Therapeutic Serums.—Schlossmann pleads for compulsory correct labeling of various serums used in treatment. For instance, an assistant of his, who published a critical note, was sued by a company putting out a serum from calves inoculated with cowpox, under the name of whooping cough serum, without any sufficient experimental and clinical basis. He criticizes most severely the way in which Degkwitz has brought out a serum from sheep inoculated with an alleged measles material as a preventive serum against measles. Degkwitz' paper contains quite a few interesting side-lights but certainly no basis for this treatment. The results of attempted immunization with this serum at Schlossmann's clinic were so sad that the company manufacturing Degkwitz' serum has decided to withdraw it from sale. He also requires that various scarlet fever antiserums which have been put out recently by German manufacturers should be better tested before they are offered for sale.

Differentiation of Achylias.—Katsch and Kalk state the following degrees of secretory function of the stomach: the first is production of acid after ingestion of a simple test meal. The second degree is production of acid only after subcutaneous injection of 0.5 mg. histamine; a weaker stomach is unable to secrete any acid but secretes some of the neutral red injected intramuscularly (5 cc. of a 1 per cent solution). The next degree reacts only with an increased secretion, but no acid, to the injection of histamine. There is no reaction at all in the gravest cases. The injection of histamine is especially valuable in differentiation between neurogenic and organic achylia.

The p_H and Pain.—Gaza and Brandi injected isotonic phosphate buffer solutions of various hydrogen-ion concentrations (p_H 5.9-8.0) into skin and muscles. The injection was painless in alkaline and neutral mixtures. All the acid mixtures (p_H below 7.2) caused marked transitory pain, which was almost unbearable with a p_H of 5.9. The tissue fluid acts as a buffer, and therefore a slow injection is practically painless. Intramuscular injection of acid solutions caused unpleasant sensations resembling those in overexertion. They review the significance of hydrogen-ion concentration for the pain in inflammation and in ischemia of tissues.

Buffer Action in Muscle and Circulation.—Eppinger, Kisch and Schwarz found after moderate exercise a much greater reduction of the alkali reserve in the blood of patients with cardiovascular diseases than in normal subjects. They attribute this to an insufficient buffering in the muscles, which may be due either to an overproduction of acid or to diminished buffering power of the muscles, due to defective circulation.

Metabolism After Venesection.—Endres found as a rule a diminished specific dynamic action of proteins in subjects

after venesections, amounting to 0.7-1 per cent of body weight.

Fragility of Erythrocytes.—Rietti reviews the Italian work on osmotic resistance of erythrocytes.

Medizinische Klinik, Berlin

22: 947-982 (June 18) 1926

Vegetative Nervous System. F. Glaser.—p. 947. C'td.
Dietotherapy. E. Vogt.—p. 950.
*Narcolysis and Organ Training. I. H. Schultz.—p. 952.
*Kidney Insufficiency. E. Becher.—p. 955.
Surgery of Otitis Media. L. Soyka.—p. 956.
Lesion of Frontal Lobe. R. Klein.—p. 957.
*Blood Calcium and Arsphenamine. J. Schumacher and W. Liese.—p. 957.
Lymphogranulomatosis of Intestine. W. Heimann-Hatry.—p. 958.
Kidney Function and Calcium. E. Baráth and Gyurkovich.—p. 960.
Anemia in Pregnancy. T. Drexel.—p. 961.
Disinfection by Silver Chloride. B. Pfab.—p. 962.
Pneumonia in Heart Disease and Occupation. Von Schnizer.—p. 966.
Orthopedic Diseases. S. Peltesohn.—p. 968.

Narcolysis and Organ Training.—Schultz was able to shorten the analytic treatment when using light anesthesia with ethyl chloride to remove inhibitions. He calls this method narcolysis. He also uses a system of training in relaxation ("autogenic exercise of organs") to induce autohypnosis. He characterizes the latter method as fakirism.

Kidney Insufficiency.—Becher has found that the pale urine of patients with chronic nephritis contains chromogens which can be converted into the same dyes which give normal urine their color. If such a pale urine, containing albumin, becomes much darker after being shaken with kaolin, it speaks for nephritis.

Blood Calcium and Arsphenamine.—Schumacher and Liese attribute the lowering of toxicity of arsphenamine preparations by calcium to a precipitation of the arsphenamine base by the calcium. It occurs more rapidly with higher calcemia than in normal blood. The arsphenamine base is soluble in lipoproteins, and they assume that this increases the therapeutic effect. The calcium chloride injection has to precede that of old arsphenamine. If it were mixed with it, a precipitate would occur which might cause embolism. Contrary to this, neo-arsphenamine can be dissolved directly in a calcium chloride solution, since the products of this mixture are more soluble. The toxic action of neo-arsphenamine is not reduced by calcium salts in the same degree as that of arsphenamine. It seems that calcium administration by mouth has also a favorable action.

Münchener medizinische Wochenschrift, Munich

73: 1017-1056 (June 18) 1926

Hygiene of Everyday Life. E. Friedberger.—p. 1017. C'td.
*Mercury Poisoning from Dental Fillings. F. Flury.—p. 1021.
Intraspinal Autoserotherapy in Encephalitis. H. Pette.—p. 1025.
*Arthritis Deformans and Trauma. P. Seeliger.—p. 1027.
Silica and Calcium Metabolism. A. Bickel.—p. 1028.
*Treatment of Fistulas with Copper Sulphate. J. Rey.—p. 1029.
Orsos' Autovaccine. K. v. Berde.—p. 1031.
Third Meinicke Reaction. J. Hohn.—p. 1034.
Heart Apex Beat. A. Schüle.—p. 1035.
*Chladni on Mechanical Treatment of Malaria. E. Ebstein.—p. 1035.
Indications for Balneotherapy. H. Weskott.—p. 1036.
*Comment on "Mercurial Poisoning." A. Stock.—p. 1056.

Mercurial Poisoning from Dental Fillings.—Flury concludes that mercury poisoning was possible with the old-fashioned amalgams, especially of copper, but not with the complex mixtures which are being used at present. He believes that about 1 mg. of mercury per day might cause a mercury poisoning. The amount of mercury contained in a filling could yield only fractions of a milligram if resorbed within five to ten years. Stock, who has suffered together with his collaborators from chronic mercury poisoning due to the mere presence of mercury in his laboratory, which was not diagnosed until recently, points out that far smaller amounts of mercury—some hundredths of a milligram daily—may cause chronic poisoning in a few years. Its symptoms are slight headaches, mental fatigue, impaired memory, irritability, restlessness, and chronic colds. He has learned recently about fifty similar cases among chemists and physicists.

Arthritis Deformans and Trauma.—Seeliger demonstrated experimentally that a hemorrhage in the joint can be resorbed completely if the synovial membrane has its normal alkalescence. It is, however, necessary to start passive and active movements as soon as possible. In a predisposed person with a slight shifting of the synovial reaction toward acidity, an injury may be the provoking cause of the deforming arthritis. The lesion in one joint may cause an increased strain on another joint which may also become the site of arthritis. Therefore the injury of one joint may be regarded in such a case as the provoking cause of the arthritis of the other joint which had not been injured.

Treatment of Fistulas with Copper Sulphate.—Rey had good results with injections of 2-3 cc. of a 10 per cent solution of copper sulphate in tuberculous and especially in osteomyelitic fistulas. The surroundings of the fistula are protected by petrolatum. A second injection may be given from three to four weeks later.

Chladni on Mechanical Treatment of Malaria.—Ebstein reprints part of a paper published 110 years ago by the famous physicist Chladni. The latter reported that constriction of extremities in the beginning of an attack of malaria stopped the chill, although not the fever. The next attack, however, did not arrive. The method is old—it had been used by Galen in certain diseases—and Chladni mentioned it as a popular treatment in Russia.

Zentralblatt für Chirurgie, Leipzig

53: 1361-1424 (May 29) 1926

A Method of Closing Parotid Gland Fistulas. E. Hesse.—p. 1361.
Subdeltoid Injection in Periarthritis of Shoulder. E. Schulhof.—p. 1364.
*Vasomotor Collapse in Spinal Anesthesia. H. Ziegner.—p. 1367.
"The Fabella." B. Ulrichs.—p. 1369.

Guarding Against Vasomotor Collapse in Spinal Anesthesia.—Ziegner uses this method for operations on the lower half of the body only. To guard against the dangerous fall in blood pressure on entrance of the procaine solution into the thoracic segment of the spinal cord, Ziegner has his patients sit up until the vasomotor sign is positive, the reflexes are lost and mobility of the lower extremities has begun to disappear. As an added precaution, a small quantity of spinal fluid may be withdrawn after the anesthesia has set in, to remove any of the anesthetic that may remain free in the fluid before the patient lies down.

53: 1425-1488 (June 5) 1926

*Carbon Dioxide Inhalation in Surgery. A. Dzialoszynski.—p. 1426.
*Aponeurosis as Suture Material in Hernictomy. S. Sofoteroff.—p. 1430.
*The Incision in Phlegmon of the Ischiorectal Fossa. Kokoris.—p. 1433.
The Indications for Förster's Operation. A. Kortzeborn.—p. 1435.
*Torsion of the Testicle. V. C. Irk.—p. 1437.
*Coagulation Test in Cancer Diagnosis. H. Bock and C. Rausche.—p. 1440.
*Dangers of Paravertebral Injections in the Neck. H. Friedrich.—p. 1441.

Carbon Dioxide Inhalation in Surgery.—Dzialoszynski reports great satisfaction in the Charlottenburg-Westend municipal hospital from postoperative inhalation of carbon dioxide. Respiration is stimulated thereby, and the anesthetic is eliminated much more rapidly than otherwise.

Strips of Aponeurosis as Suture Material in Herniotomy.—Sofoteroff states that a strip of aponeurosis 8 cm. long and 1 cm. wide will sustain a weight of 3,500 Gm.; one 13 cm. long and 1 cm. wide, a weight of 3,000 Gm. A strip 8 cm. long and 1 cm. wide tears with difficulty under a weight of 5,000 Gm. When it is used for suture material, the deep sutures do not cut through. Its elasticity is a disadvantage, as the ends easily slip out of the knot.

The Incision in Phlegmon of the Ischiolateral Fossa.—Kokoris prolongs the lateral sagittal incision in a curve behind the anus, and separates the sphincter from the coccyx. In this way, healing is ensured and the function of the sphincter does not suffer.

Torsion of the Testicle.—In one of Irk's two cases a boy, aged 16, developed torsion of an undescended testicle during heavy lifting. The diagnosis first made was strangulated hernia. At operation on the third day the testicle, in a gangrenous condition, was removed; the patient recovered. The second case was complicated by hydrocele with hernia into the hydrocele sac. The torsion of the testicle, the symptoms of which appeared suddenly while the patient was sitting down after a day of hard work, included the hydrocele and

the herniated intestine. Operation was performed after about twelve hours. The intestinal walls were only slightly swollen and cyanosed, and gangrene of the testicle had not yet set in. This patient also recovered.

Blood Coagulation Test in Cancer Diagnosis.—Bock and Rausche employ the following technic: In a series of ten test tubes are placed one to ten drops, respectively, of a 2 per cent solution of magnesium sulphate. Then 1 cm. of blood, drawn from a vein, is added to each test tube. The tubes are shaken and left for two hours, after which they are examined to see how many drops of the magnesium sulphate solution had been required to prevent coagulation of the blood. In the case of normal blood, three to five drops are sufficient. In sixteen out of eighteen cancer cases, verified at operation, they found that seven to eleven drops were required. The twelve cases of gastric ulcer examined required only one to three drops. The same was true of three cases of icterus. Thirty-five cases of various other diseases showed an almost normal coagulation valency, the range being from three to six drops.

Dangers of Paravertebral Injections in Goiter Operations.—In making a paravertebral injection in a patient with a short, thick neck Friedrich inadvertently punctured the spinal canal. The syringe contained no anesthetic, so that the fluid was immediately recognized as spinal fluid. He believes that such punctures can occur more easily than supposed, and are a cause of many of the severe collapses experienced when paravertebral anesthesia is applied to the cervical region. Since this accident the method has been abandoned for goiter operation in the Erlangen university clinic.

Zentralblatt für Gynäkologie, Leipzig

50: 1745-1808 (July 3) 1926

*Ultraviolet Irradiation. Von Schubert.—p. 1746.
Striae Gravidarum and the Physical Constitution. Seynsche.—p. 1749.
*Lactic Acid of Blood in Pregnancy. G. K. F. Schultze.—p. 1759.
*Etiology of Rupture of Uterus. L. Lederer.—p. 1761.
*Cancer in Stump After Supravaginal Amputation. F. Isbruch.—p. 1771.
"Anesthesia in Treatment of Abortion." F. Heimann.—p. 1776.
*Median Perineotomy. D. von Ott.—p. 1781.
Two Operative Cases of Uterus Duplex Bicornis. S. Sztehlo.—p. 1782.

The Ultraviolet Rays from the Physical Standpoint in Gynecology.—Schubert describes experiments on the walls of the vagina in large dogs and on human specimens obtained at operations, which seem to exclude the possibility that the ultraviolet rays pass through the wall. At the same time, the directly exposed portions of the vaginal wall may be irritated by the rays enough to induce hyperemia, which may have a curative action, and the visible rays—which do penetrate the vaginal wall to a certain extent—may add their influence. His further research has shown that the ultraviolet rays pass through the skin and certain mucosas and act on the blood. The effect is thus general rather than local.

The Lactic Acid Content of the Blood in Pregnancy.—Schultze has been applying to thirty-seven pregnant women the Mendel-Goldscheider micromethod for determining the lactic acid in the blood, after research on numerous healthy controls. In normal nonpregnant women, the average was 11 mg. per hundred cubic centimeters, the range from 9 to 13 mg. The range in the pregnant was from 12 to 20, with an average of 15, but in one woman with eclampsia, the figure was 25.5, and it was 20.5 and 21.5 in two others with symptoms suggesting impending eclampsia.

Rupture of the Uterus During Delivery.—Lederer presents evidence to show that many of the instances of rupture ascribed to various causes are in reality due to microscopic changes, usually from infection, which weaken the tissues and readily explain the rupture.

Cancer in Stump After Supravaginal Amputation.—Isbruch describes two recent cases of stump carcinoma after supravaginal amputation of the myomatous uterus. He compares them with sixty-five similar cases he has found on record, and says that the advantages of the supravaginal operation need not be given up if search for microscopic malignant disease is made before every operation for myoma, and especially during the operation. The stump should be short, and the women should be examined occasionally for years afterward, to detect suspicious manifestations in their incipiency.

Obstetric Prophylactic Slitting of the Perineum.—Ott confirms the advantages of a deep median incision in the perineum during delivery as a prophylactic measure to guard the muscles against injury. He has been applying this median perineotomy for thirty-one years and in several thousand cases. The pressure of the head always injures the perineal muscles, and leaves more or less of a tendency to prolapse.

Zentralblatt für innere Medizin, Leipzig

47: 585-600 (June 19) 1926

Rhodan and Arterial Hypertension. K. Westphal.—p. 585.

47: 601-648 (June 26) 1926

*Familial Leukemia. E. Schereschewsky.—p. 643.

Familial Leukemia.—Schereschewsky reports that chronic lymphatic leukemia developed in a brother and sister, now aged 61 and 54. The liver and lymph nodes were enlarged in both and the spleen in the woman. Roentgen irradiations improved the general condition in both, and in the man the enlarged glands grew smaller and the number of leukocytes declined. Weiss has reported the case of a family in which a brother and a sister had chronic lymphatic leukemia and another brother the same in an acute form; Rosenow, chronic lymphatic leukemia in a man and his mother.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

1: 2321-2452 (June 5) 1926

Bismuth in Syphilis. Mendes da Costa and Papegaaij.—p. 2324.
An Epidemic of Benign Jaundice. P. J. J. Honig.—p. 2347.
Infanticide at Twin Birth. J. P. L. Hulst.—p. 2349.
*Misleading Distant Reflex Phenomena. L. S. Hannema.—p. 2356.
*History of the Evolution of Endocrinology. J. Koopman.—p. 2359.
"Fames Canina." J. Schrijver.—p. 2366.
History of Obstetric Anesthesia. J. G. Salomonson.—p. 2367.

Misleading Reflex Phenomena.—The operation for the apparently unmistakable duodenal ulcer of long standing revealed normal conditions in the stomach and duodenum. The liver was large and smooth and no signs of an abscess could be found. Necropsy revealed numerous minute abscesses deep in the liver, and thrombosis in the portal vein, with old chronic appendicitis—the picture of what Dieulafoy described as the appendicular liver. In a second case, chronic appendicitis had induced by reflex action spasm of the pylorus, which had dominated the clinical picture.

Evolution of Organotherapy.—Koopman traces the history of endocrinology farther back than Homer. In 1602, organotherapy from fifty-nine animals was official at Innsbruck, and in 1765 the number had increased to 152. As long ago as 1788, Cawley reported a case of diabetes in which the pancreas was found atrophied, with calculi. Even insulin is the outcome of a long series of researches in former centuries. He mentions parenthetically that blood transfusion was expressly forbidden by the authorities at Rome and in France. It had proved inevitably fatal when done under the conditions of the eighteenth century and before.

Acta Chirurgica Scandinavica, Stockholm

60: 193-290 (May 21) 1926

Function of the Bile Ducts. IV. J. Berg.—p. 193.
*Prognosis and Methods of Embolectomy. G. Nyström.—p. 229.
Aseptic Resection of the Colon. H. Olivecrona.—p. 255.
*Mobilization of Ankylosed Knee. R. Ingebrigtsen.—p. 269.
Tendovaginitis or Tendinitis Stenosans. R. Hanson.—p. 281.
Case of Dislocation of the Hand. E. Michaelsson.—p. 287.

Prognosis and Methods of Embolectomy.—Nyström states that embolectomy for impending gangrene of the extremities has been successful in more than one third of the seventy-four published cases. Arteriosclerosis is not a distinct contraindication. With an embolus at the bifurcation of the aorta or in the common iliac artery, the difficulty and danger of laparotomy are often great, and he suggests that, if the embolus cannot be removed by a sound introduced into the vessel, the hand may be introduced from the groin retroperitoneally, and the embolus be milked down to a place in the femoral artery from which it may be conveniently removed.

He reports five cases, in three of which there was recovery; in one of these however, although the circulation was restored, gangrene set in, necessitating amputation. In another surviving patient, a woman, aged 64, with heart disease, there was an embolus in both femoral arteries in the groin. They were removed by arteriotomy directly over the emboli.

Mobilization of Ankylosed Knee.—Arthroplasty of a knee ankylosed from childhood from tuberculosis restored function to the extent of 75 degrees of flexion in a woman, aged 21. This amount of flexion has been maintained for three years. In raising the other leg, the knee of which is ankylosed, she is able to support the weight of the body on the mobilized knee.

Acta Psychiatrica et Neurologica, Copenhagen

1: 1-104, 1926

Jean Martin Charcot. A. Friedenreich.—p. 3.
Lipiodol Test in Spinal Cord Tumors. Brouwer and Oljenick.—p. 15.
*Paralysis of Foot, of Cerebral Origin. V. Christiansen.—p. 39.
Pontoneocerebellar Hypoplasia. S. Koster.—p. 47.
Catatonia and Melanoderma. V. Wigert.—p. 84.

The "Acta Psychiatrica et Neurologica."—This new journal has been founded by a group of psychiatrists and neurologists in Denmark, Finland, the Netherlands, Norway and Sweden. The editor in charge is Dr. K. H. Krabbe, Østerbrogade 21, Copenhagen.

Complete Spastic Paralysis of the Left Foot, of Cerebral Origin.—Christiansen's patient presented a syndrome which is characteristic of a cortical lesion of the contralateral motor centers, but is often misinterpreted: complete spastic paralysis of one foot, accompanied by cerebral hemiplegia of the same side. Sometimes, as appeared in this case only when the patient was unusually fatigued, there is spastic paralysis of the foot of the other side, and Babinski's sign. The paralysis, of the left foot in this case, had developed slowly and progressively, closely associated with jacksonian attacks, over a period of seven years. There was headache, but total absence of corpus striatum symptoms. At operation there was found an extracerebral tumor which had greatly compressed the right hemisphere and had dislocated the falx so that the left hemisphere also was pressed upon. The tumor and the portion of the falx to which it was attached were removed. The patient has now a spastic paresis of the left leg, which will probably improve with time. The long duration of the tumor had evidently brought about a secondary degeneration of the pyramidal tracts of the right hemisphere.

Finska Läkaresällskapets Handlingar, Helsingfors

68: 397-508 (May) 1926

History of Trachoma in Finland. Grönholm and Hjelmman.—p. 397.
*Course of Articular Rheumatism. O. Holsti.—p. 414.
*Poisoning from Copper Utensils. H. Sternberg.—p. 459.
Thyrotoxicosis and Metabolic Disorders. J. Wahlberg.—p. 468.
Influence of Age and Season on Child Health. Lövegren.—p. 474.

Course of Acute and Chronic Articular Rheumatism After Treatment of Inflammatory Processes in the Upper Air Passages.—Holsti has been making a four years' follow-up study of thirty-five cases of acute and recurring articular rheumatism and of seven chronic cases. Not only tonsillitis, but all other inflammatory processes in the upper air passages had been given thorough treatment. A favorable influence was unmistakable, especially in the acute febrile form, with involvement of the heart. In the pure form, favored by puberty, there have been no recurrences to date. He noted that the persons who develop rheumatic infection are often poorly nourished and complain of gastro-intestinal disturbances, ready fatigue and migraine. Some of the patients after the attacks seem to require vigorous tonic treatment, eventually protein therapy. No benefit seemed to be realized in the chronic cases at first, but in three there was a decided improvement in the course of the year.

Copper Salts as Factor in Gastro-Intestinal Disease.—Sternberg warns of the danger of chronic poisoning from cooking vessels when the tin coating over copper wears off, or copper vessels are used. A polished knife blade, dipped in vinegar and then placed for an hour in the food suspected, develops a rusty deposit in the presence of copper salts. The color changes to blue when moistened with ammonia. Acute copper salt poisoning can be treated with lavage and white of egg; the chronic form with finely pulverized iron, or iron compounds, which attract the copper out of its combinations.

Hygiea, Stockholm

88: 353-384 (May 15) 1926

*Melanosarcoma in the Liver. P. G. Månsson.—p. 359.
Suggestions for Railroad Transportation of the Sick. J. A. Hedlund.—p. 365.

Melanosarcoma of the Liver.—The clinical picture was a combination of Banti's disease and Addison's disease in a boy, aged 4. Necropsy revealed that the liver was totally transformed into a melanosarcoma. No primary tumor could be found elsewhere.

88: 385-432 (May 31) 1926

*Acute Dilatation of the Stomach. M. Arborelius.—p. 385.
The Anatomic Basis for Monocular and Binocular Vision. R. Bárány.—p. 403.

88: 433-464 (June 15) 1926

Diabetic Versus Benign Glycosuria. Y. Akerrén.—p. 433.

Acute Dilatation of the Stomach, Especially with Infectious Diseases.—Arborelius describes three cases in which the acute dilatation of the stomach developed in the third or fourth week of pneumonia or other infectious disease, as the temperature returned to normal and the patients began to take more nourishment. Under repeated evacuation of the stomach, clinically normal conditions were restored, and the motor function has been normal since. Fluid was supplied by subcutaneous drip infusion. Although the debilitated patients needed nourishment, none seemed to be absorbed from the stomach, and he thinks it is wiser to leave the stomach entirely in repose for the first few days. No postural treatment could be attempted on account of the weakness and general condition. No effect was observed from massage and tapping on the stomach as in attempts to overcome inertia of the uterus, but this might answer in less debilitated patients. The main thing, however, is to think of the possibility of acute dilatation, and confirm it with the stomach tube, instead of assuming poisoning, coma, volvulus, acute peritonitis or pancreatitis, or ileus—instances of such blunders, some with grave consequences, are cited. Factors depressing the functions of the bowel, fever and emotional stress may aid in bringing on the acute dilatation, especially when there is a neurotic predisposition.

Ugeskrift for Læger, Copenhagen

88: 597-612 (June 24) 1926

*Origin of Pernicious Anemia. K. Faber.—p. 597.
Isolated Trauma of the Pancreas. H. Thomsen.—p. 602.

Intestinal Origin of Pernicious Anemia.—Faber's views were reviewed editorially on page 249.

88: 613-632 (July 1) 1926

*Function of the Tonsils. V. Schmidt.—p. 613.
*Protein Therapy with Chronic Polyarthritis. E. Faber.—p. 619.
Suicides in Copenhagen, 1905-1925. P. Heiberg.—p. 626.

Antibody Production in the Tonsils.—Schmidt massaged the tonsils in eighteen healthy persons and noted thereafter that the leukocyte count declined. The lymphocytes were the elements which disappeared in the peripheral blood, and he thinks there can be no question that this is a reaction to the forcing out into the blood stream of an antibody formed in the tonsils. Massage of actively diseased tonsils elicited a reaction in the form of a polymorphonuclear leukocytosis.

Protein Therapy in Chronic Polyarthritis.—No results were visible in eleven cases, but in sixteen there was more or less marked improvement and in two a complete cure followed the treatment, out of the twenty-nine given parenteral injections of various proteins by Faber. He deplores the lack of perseverance in keeping up treatment, and the peculiar readiness of these patients to resort to new measures recommended by the laity. They seem unable to realize that polyarthritis, like tuberculosis, requires long and systematic treatment. The fact that a fever so often disappears under the protein therapy indicates that it really acts on the cause.